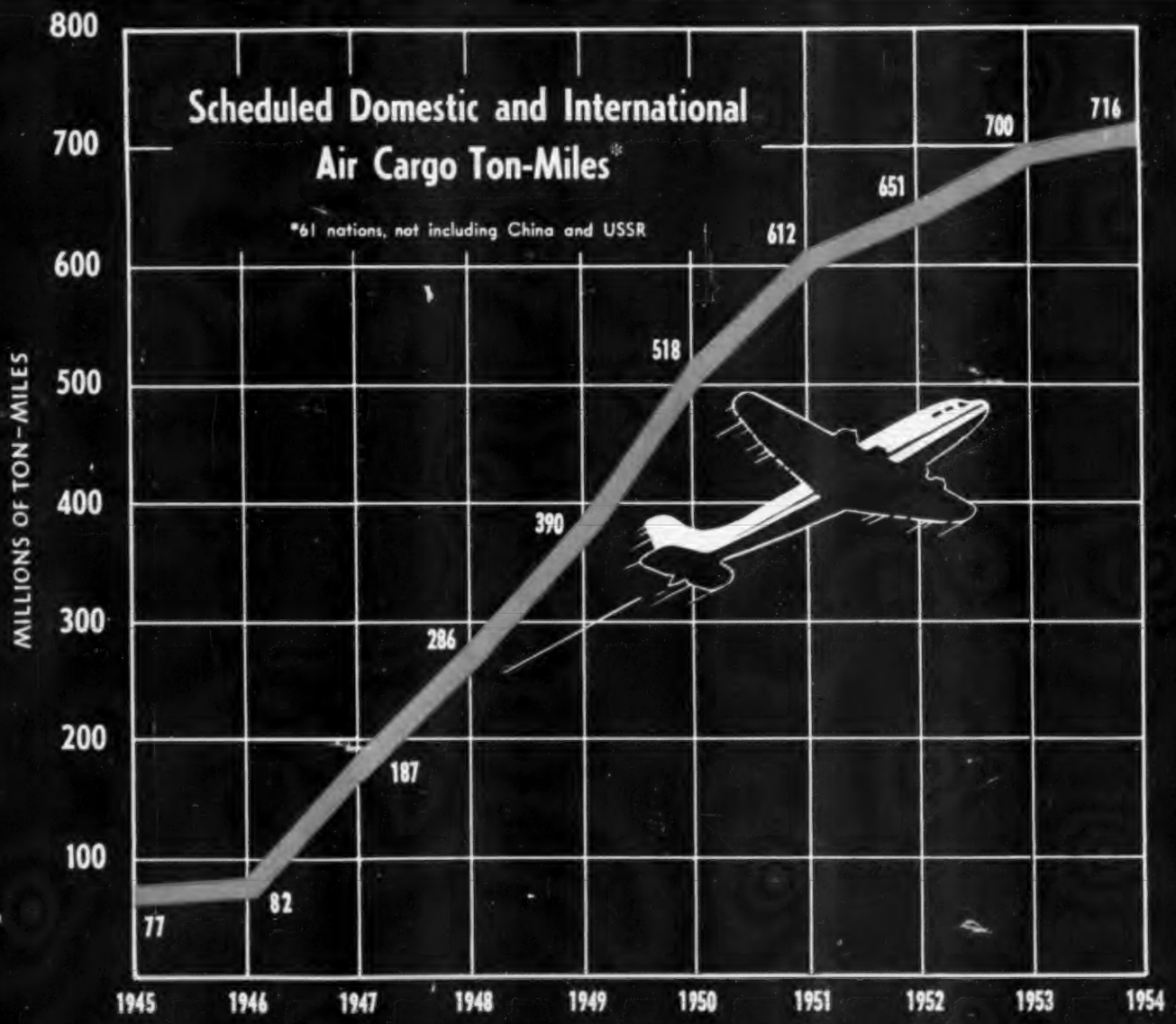
BUSINESS

AIR TRANSPORTATION

Vol. 26, No. 2 THE AIR MAGAZINE FOR THE BUSINESS EXECUTIVE February, 1955



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Air Cargo's Got the Big Punch
Ground Handling Receives a Boost
We Flew There and Saw for Ourselves
Let's Talk it Over
The Hercules Story

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Air Freight Forwarders

Air Express International: C. L. Gallo, president, points out that AEI's new specific commodity tariffs will save exporters of automotive and aircraft parts and equipment as much as 31.5% on international air shipping costs. Rates apply to export shipments of 50 pounds and over to major world destinations. Airline specific commodity rates generally require 100-pound minimums.

West Coast sales managership has been taken over by A. M. Stephenson, ex-Midwest regional manager. Headquarters will be in Los Angeles. He will coordinate AEI's sales effort in the entire West Coast area.

United Parcel Service-Air: Reductions of 11¢ to 14¢ per package on all air shipments between New York and other domestic cities service by the company have been announced. For example: a one-pound air package, shipped from New York to Los Angeles, has dropped from 63¢ to 52¢. Rate includes delivery direct to consignee, as well as insurance up to $200.

Civil Aeronautics Board

As expected, exceptions to CAB Examiner Paul N. Pfeiffer's decision in the Air Freight Forwarder Investigation have been filed with the Board by a number of organizations, including the Chicago Association of Commerce and Industry and the Railway Express Agency. *(See Pfeiffer's recommendations in January, 1955, AT.)*

The Chicago group doesn't go along with Pfeiffer's premise that because the CAB has established jurisdiction over a California flower-growing combine that it has the same jurisdiction over all similar shipping associations. Often many such groups "operate under entirely different arrangements and circumstances," the Chicago association said. It would have the Board overrule Pfeiffer and rule that cooperative associations are not common carriers for hire, therefore not subject to regulation.

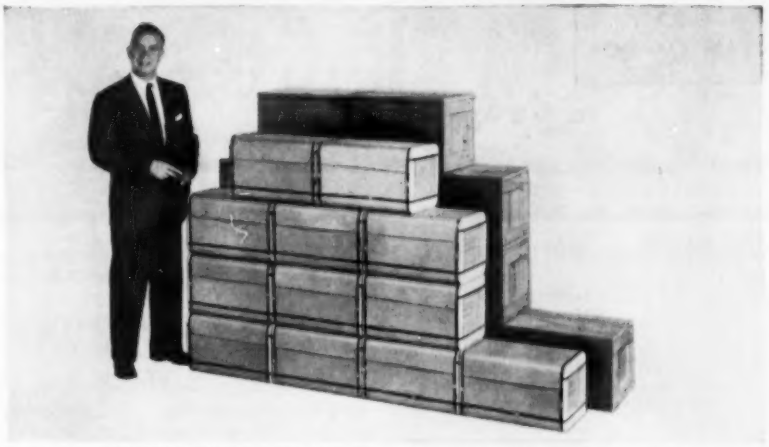
REA has taken wider exception to the examiner's recommendations which are regarded as generally favorable to forwarders. Stating that "all that forwarders have done is to substitute their services for the air services of the carriers," REA pointed out that in view of the lower rates at which forwarder traffic moves, "the net result is that the airlines receive less revenue than they would have received had the forwarders not diverted the traffic to their services."

Commercial Aircraft

Hard words, misguided for the most part, have been flung at BOAC in the British press and Parliament. Reason: the airline's interest in the DC-7D as a standby transport (for which no order has been placed). BOAC has on order 25 *Britannias,* with an option for eight more, which will seat up to 104 passengers. But BOAC's realistic executives know that, despite their

(Continued on Page 5)

New container material increases warehouse capacity



SPACE-SAVING Tekwood Straparound* boxes in front have same interior dimensions as conventional wood boxes in back.

Tekwood box at right weighs 12.1 lbs.; wood box weighs 17.9 lbs. Yet both hold the *same amount* of goods.

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See how a dozen Style 2 wood boxes loom over the patented Straparound* Tekwood box in top picture. With same interior dimensions, the Tekwood box *takes up 27% less space!*

30% CUT IN TARE WEIGHT. Small illustration at the left shows how Tekwood box of same interior cubage weighs 32% less than Style 2 wood box.

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VOL. 26 FEBRUARY, 1955 No. 2

Sabena Announces Major U. S. Expansion Program

NEW YORK—Here on a visit from Brussels, Sabena's president, Willem Deswarte, took the occasion of a press conference to announce several important steps in the Belgian airline's United States program.

Sabena's general sales and executive offices for North America will move to 720 Fifth Avenue, while its new international ticket office already has relocated at 589 Fifth Avenue. District sales offices will be opened in Philadelphia, Atlanta, and Cleveland; and street-level offices are to be inaugurated in Los Angeles and San Francisco. United States personnel are to be increased by one-third. Meanwhile, Sabena has upped its promotional and advertising expenditures to complement the physical expansion.

Agricultural Shippers' Groups Opposed by ATA

WASHINGTON, D. C.—In a statement made before the National Agricultural Cooperative Committee of the National Council of Farmers' Cooperatives, Russell S. Bernhard, assistant general counsel of the Air Transport Association, asserted that the scheduled airlines do not believe that any useful purpose would be served by legislation proposing exemptions in the Civil Aeronautics Act for bona fide farmers' cooperatives and shippers' associations. The latter groups are not subject to the Act, he said.

Bernhard stated that the airlines see no necessity for establishing an exempt class of air carriers specializing in agricultural products. The ATA-member airlines are cooperating closely with the farmers to create new markets and to adapt the advantage of air transportation to the particular needs of agricultural traffic, he said.

The best interests of the shipper and carrier, Bernhard said, will be served by the necessary transportation being performed within the Federal regulatory framework.

British Air Ferry Service to Expand

LONDON—Silver City Airways, which ferries automobiles, motorcycles, bicycles, and passengers across the English Channel, has received approval from the Minister of Transport and Civil Aviation to inaugurate service from Elmdon Airport, Birmingham, to Le Touquet, France. SCA will receive a seven-year license to operate this service up to three round trips daily.

NWA Objective: To Increase Cargo Revenues by a Million

ST. PAUL—The creation of two new divisions is tied in with Northwest Orient Airlines' effort to boost 1955 cargo revenues by at least a million dollars. J. W. Mariner, vice president-sales, an old cargo man himself, declared that the staff of each new division will be increased, including properly trained representatives "to assure maximum solicitation of the cargo business."

The new setups are to be known as the Air Freight Sales Division, headed by Thomas R. Nolan as director; and the Air Mail and Air Express Division, under Fred R. Erickson, also director.

At the same time, Frank C. Judd, vice president-operations and engineering, has instructed all station managers and personnel under them to emphasize the expeditious handling of all types of cargo.

NWA's cargo expansion program includes the education of all its employees in the various aspects of shipping by air. The company has prepared special folders "to acquaint them with schedules, rates, commodities, and other technical points."

Mariner let it be known that the program would not be on a hit-or-miss basis. It will be a continuing one aimed at getting the most out of the cargo business.

Northwest's present daily overnight freight flights between New York and Minneapolis-St. Paul, via Milwaukee, may be extended from the Twin Cities to Seattle. The latter is in the planning stage right now.

Nolan Erickson

ANIMAL CONFAB

Listeners to Disc Jockey Ed Schaunsey's radio program in Pittsburgh recently were treated to some inside stuff on how animals are shipped by air. Al Levenson (left), KLM's air cargo manager, shown with Schaunsey, meanwhile grabbed the opportunity to slip in a few big plugs for air cargo.

Pitney-Bowes Now Macey Collator Distributor

STAMFORD, CONN.—The Macey Company, which produces paper collating equipment, has named Pitney-Bowes, Inc., manufacturers of postage meters and mailing machines, as a principal distributor. Pitney-Bowes, which has a national sales and service organization of more than 1,600 men operating out of approximately 250 points, also distributes its own products.

3rd Daily AA Freighter

LOS ANGELES—American Airlines' daily all-cargo lift out of Los Angeles has been increased to 28,000 pounds as the result of a third daily airfreighter. Total freight lift out of this city, with three airfreighters and 27 combination planes, is 123,000 pounds a day. According to Frank H. Burg, district manager, the added plane, a DC-6A, provides overnight nonstop service to Chicago, through service to Detroit, and connecting service to major Eastern cities.

ACTA Asks CAB For Quick Action on Air Exchange

WASHINGTON, D. C.—The Aircoach Transport Association, which represents more than 30 independent airlines, has asked the Civil Aeronautics Board for immediate permission to operate an air exchange for freight and passengers.

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hopes for the British-built *Britannia*, it has yet to prove itself. The *Comet* experience is still fresh in their minds. Meanwhile, the airline must continue to compete all over the world with the best aircraft available. Hence this statement by Sir Miles Thomas, BOAC's chairman:

"In public controversy aroused by our aircraft equipment problem, particularly that concerning the next four to five years, too many people fail to appreciate that the primary and statutory duty of BOAC is to operate a worldwide airline. If we do not take steps to have the right airplanes at the right time, Britain will cease to rank among major intercontinental air transport undertakings.

"We are essentially a commercial enterprise engaged in vigorous competition with airlines of other nations on air routes of the globe; therefore, the passengers must be our first consideration. Neither must the need for BOAC to carry mail and freight as speedily and frequently as the public requires be overlooked when questions of our future aircraft fleets are being considered. Moreover, as we are in a fluid and rapidly-developing industry, our motive must always be to offer the kind of aircraft most suitable for the routes on which they fly and to give the best possible service to our customers in whatever country they may be.

"If we do not, then our traffic will unquestionably go to our competitors—let no one have any illusions about that hard, inescapable fact."

Panagra reports that the DC-7s it will receive a few months from now will be equipped with a flexible forward compartment just aft of the cockpit which, in a matter of 15 minutes, can be converted from passenger quarters to a cargo hold. The "two-way" space holds will accommodate 4,200 pounds of cargo or eight passengers.

Lufthansa, which has four Lockheed *Super Constellations* on order with which the German airline hopes to inaugurate transatlantic service, has ordered four more aircraft of the same type.

TWA President Ralph S. Damon has suggested that vertical-rising transports may become the order of the day in the years to come. This will do away with the present need for giant airports.

Airports

Freight handling at Seattle-Tacoma International Airport during the month of November, 1954, dropped to 2,070,118—a loss of 315,008 pounds since the previous month. However, this total surpasses the November, 1953, total by 42,824 pounds. The total of express pounds handled in November, 1954, was 185,259, a gain of 3,838 pounds over the October, 1954 total.

Materials Handling

The Materials Handling Institute expects to chalk up a 15% business gain for materials handling equipment manufacturers this year. Forecast for 1955 is a sales volume of more than $1,250,000,000. The expected increase will just about make up the slump in 1954. The 59 member companies of MHI account for two-thirds of the industry's dollar volume.

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will be held May 16-20 in the new exposition hall recently completed as an addition to Chicago's International Amphitheatre. Indoor exhibit space has been upped 15% over the area used when the industry last held its exposition in Chicago. A parley will be run concurrently with the exposition—a revival of a former practice. Theme for the show is *The Concept of Obsolescence.*

The Conveyor Equipment Manufacturers Association has sponsored a new 16 mm. film, *Movement of Life,* which runs for 20 minutes. According to R. C. Sollenberger, president, it contrasts primitive methods of materials handling with modern methods, and presents a story of how the development of civilization has depended on controlled movement. The picture, which was produced by Biofilms, may be borrowed free of charge. *Consult Item* 48 *in* Come 'n Get It *in this issue.*

Packaging

The American Management Association, which will hold its 24th National Packing Exposition in the New Exposition Hall and the South Hall of the International Amphitheatre, Chicago, anticipates an attendance of some 300,000 business executives. They will come from all parts of the United States and abroad. Date is April 18-21. Although the show, at this writing, is about three months off, AMA reports that more than 330 exhibitors already have reserved more floor space than the total area occupied by last year's record-breaking exposition.

According to A. K. Thorn, manager of AMA's Packaging Division, the 1955 show will give more attention to industrial packaging and packing than ever before. Last year's exposition was held in Atlantic City.

Perishables

Riddle Airlines has opened stations at West Palm Beach, Stuart, Orlando, Sarasota-Bradenton, and Fort Myers to handle Florida's vegetables, fruits, flowers, and even tropical fish. (Tampa and Lakeland stations were due to be opened soon.) Overnight service has these commodities in New York ready for the morning market. Interline connections provide onward carriage to as far north as Montreal and Toronto.

Flights

TACA has announced the operation of nonstop daylight flights from New Orleans to Guatemala, with connections to all Central American capitals, Mexico City, and Panama.

Japan Air Lines inaugurates twice-weekly DC-6B service between Tokyo and Hong Kong, via Okinawa, on February 4.

Heavy Cargo

Pan Am recently flew 50,924 pounds of gas water heaters—348 units in all—from Miami to Barranquilla. Two hundred units were 20-gallon heaters; the rest, 30-gallon. Consignee: Compania Colombiana de Gas.

AIR TRANSPORTATION

The World's First and Only Air Cargo Magazine . . . Established October, 1942

BPA

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AIR TRANSPORTATION, published once each month, thoroughly covers the entire air cargo industry for the benefit of all those engaged in shipping and handling domestic and international air freight, air express, and air parcel post, as well as using the domestic and international air mail services. Included in AIR TRANSPORTATION'S wide coverage are: air shipping, cargoplane development, rates, packaging, materials handling, documentation, air cargo terminal development, insurance, routing, interline procedures, new equipment, commercial airlines, military air transport service, air freight forwarders, and business flights.

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United States Airlines

Airwork Atlantic: Milton Patterson appointed general traffic-sales manager; William Gray, station manager at Idlewild; Arthur D. Appleby, executive sales staff. All are former Pan Am men.

Bonanza: Bruce M. Ryan named Arizona sales manager.

Capital: George L. Wertenbaker has resumed his former position as assistant to the vice president of traffic and sales.

Continental: Effective April 1, C. C. West, Jr., senior vice president, becomes executive vice president; Stanley O. Halberg, vice president-traffic and sales, takes over the vice presidency in charge of public relations and advertising; and Harding L. Lawrence, Pioneer Air Lines' vice president-traffic and sales, assumes the same office for Continental.

Northwest: Richard C. Welsh appointed district sales manager of NWA's recently opened sales office in Philadelphia.

Pan American: Carlos Milberg transferred to district traffic and sales managership in St. Thomas, Virgin Islands . . . Also transferred is Theodore C. Pelikan, now regional traffic and sales superintendent in Lima, Peru . . . Paul N. Dault appointed district traffic and sales representative in Sao Paulo, Brazil.

Panagra: Richard W. Sylvester named assistant to the vice president-sales and traffic . . . Donald A. Huff upped to the important post of air cargo manager.

Riddle: Guy N. Tomberlin named operations manager of Riddle.

Foreign Airlines

Air France: Joseph A. Verini appointed Cleveland district manager. He was formerly Eastern District agency manager.

Avianca: Gregorio Obregon, president; Jorge Gonzalez, executive vice president; and Fernando Carrizosa, financial vice president, have been honored with the rank of Commander in the Order of Cruz de Boyaca, highest decoration made by the government of Colombia.

KLM: M. E. A. L. de Jong, director of traffic and sales, has been selected as adviser on traffic and sales matters . . . P. O. Eden appointed traffic and sales manager in the United States.

Aircraft Manufacturers

Fairchild: Serving on the 1955 Air Cargo Advisory Committee are Walter Tydon, chief engineer; L. R. (Mike) Hackney, assistant to the general manager; George W. Westphal, design engineer; and Robert W. Johnson, customer relations representative . . . R. James Pfeiffer appointed director of commercial sales.

Lockheed: Vernon A. Johnson has been elevated to Washington, D. C., manager. He will continue as assistant to President Robert E. Gross.

Organizations

Air Transport Association: Willis Player, director of public relations, elected vice president.

The year just gone proved that

Air Cargo's Got THE BIG PUNCH

ONE OF THE BIG REALITIES of the air transportation industry is that the habit of air shipping has caught on. And a few more airlines have come to believe it, as witness certain belated efforts on the part of a few to get on the bandwagon. Whatever the degree of earlier standoffishness with respect to the relative importance of air cargo to total revenue, more carriers are lending a readier ear.

It's a little too early to expect precise figures on cargo results in 1954, but a fairly definite picture can be drawn from the year-end estimates sent in from different parts of the globe.

The scheduled airlines of the United States continued to rack up important gains in the carriage of freight.

The domestic trunklines last year flew some 142,000,000 freight ton-miles, which represented an increase of 7.76% over 1953. Revenues from the carriage of freight (total of $31,716,000) were 8.09% above those of the previous year. Percentagewise, the international airlines did even better, flying 82,300,000 ton-miles for a 10.26% increase, while freight revenues for the year (total of $29,531,000) rose 8.05%. The local service carriers, their 1,175,000 freight ton-miles representing a fractional drop of 0.32%, nevertheless showed a 2.81% increase in revenues (total of $475,000) in this department.

Air express told a different story. Competing with air parcel post and air freight, the trunklines flew 8.86% fewer express ton-miles (total of 38,750,000) than in 1953, revenue dropping 13.84% (total of $14,500,000). The local service carriers, not very deep in air freight, do much better with express. Last year they flew 1,100,000 ton-miles of express, a 15.17% jump over 1953. The $500,000 in express revenues—a mere $25,000 above the freight revenue total—provided a 7.99% increase. The international carriers do not haul express.

Neither Slick Airways nor the Flying Tiger Line had come through with year-end estimates at presstime. It is noteworthy that the two transcontinental all-cargo carriers recently forsook a year's effort to merge, which

(Continued on Page 28)

SAF'S AIR TRANSPORTATION SURVEY

Your Name .....

Firm Name .....

Street Number .....

City & State .....

The information given in this form is *confidential*. No member of SAF or of Air Cargo Inc., will see your survey form. All survey forms will be destroyed on completion of the tabulation and report.

• • • • •

1. Please give the best estimate of the total *number of BOXES* of flowers you ship per year and the percentage of them that you ship by air.
   Total BOXES of flowers per year ....% by air.
2. What is your relative use of Air Freight vs Air Express to your total use of air transportation?
   .....% Air Freight .....% Air Express
3. Do you have any particular comments (service, rates, etc.) about Air Express vs Air Freight?
   .....
   .....
   .....
4. Do you have any constructive suggestions as to how the air carriers could improve the actual handling of flower shipments—at terminals and in transit?
   .....
   .....
   .....
5. Have you had any undue claims problems in connection with air shipments?
   .....Yes .....No
   If yes, please briefly describe them.
   .....
   .....
   .....
6. From your own experience, enter a brief statement regarding what you believe to be the reason (s) for most claims on flower shipments.
   .....
   .....
7. What type of box is *normally* used by you for shipments of cut flowers by air?
   .....Corrugated Single Wall ..... Corrugated Double Wall
   .....Full Telescope Lid ..... Partial Telescope Lid
   .....Fibreboard .....Other .....
   (specify)
   Certificated Test Strength .....
   Manufacturer .....
8. What do you normally use for a refrigerant?
   .....Confined .....Confined .....
   Dry Ice Wet Ice Other
   .....Open .....Open .....
   (specify)
9. What do you *normally* use for insulation?
   Specify .....
10. Give the *OUTSIDE* dimensions including lid, in inches, of the sizes of boxes you normally use for air shipments, with the percentage used of each size. (Important, please measure.)

Length	Width	Depth	% of Use
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

11. Do you feel it would be practical for you to adopt a limitation of 48 inches as the maximum length of flower boxes?
    Yes..... No.....
12. Please give us any opinions or comments you may have with respect to shipping flowers by air.
    .....
    .....
    .....

Robert H. Roland

By ROBERT H. ROLAND

Executive Secretary

Society of American Florists

AIR TRANSPORTATION is a significant factor in the rapid postwar development of new flower producing areas and in the increase in production of cut flowers in established areas.

Just what is the size of this florist industry? The 1950 Census of Agriculture included a Special Census of stated that a 94% coverage of the producing units had been achieved. That provides us with rather authoritative figures.

At the farm, or producer, level, florist crops returned a total sales volume of $322,000,000. These flowers supply the needs of retail shops of every state, but the areas of production are highly concentrated. This is of direct interest to the transportation industry.

For example, over two-thirds of the total production ($215,000,000) occurred in 10 states and 70% of the total was in 100 counties, five of the first 10 of which were located in California. The first 10 states, in order of their importance, were: Pennsylvania, New York, Ohio, Illinois, California, New Jersey, Massachusetts, Florida, Michigan, Indiana. The top state produced $33,000,000 and the tenth had $12,000,000.

The past tense was used above with reason. Today, on the basis of reliable estimates, California has gone into the top position and Florida has moved from eighth to sixth. In 1950 the growing of chrysanthemums in Florida was in the experiment stage only. This year 105 acres are being grown.

Transportation-wise this is most important because both are export states.

The American florist industry has its shipping problems. So have the airlines' cargo departments. When things went wrong, they accused each other. But that didn't make much sense, especially when each industry needs the other. At long last both industries have said:

Let's Talk It Over

California must export at least 50% of its production and Florida probably 75%. Climatic conditions have made Colorado and Massachusetts particularly favorable areas for carnation production. About 85% of the Colorado production must be exported. It is shipped mainly to Southwestern and Southeastern states. From one-third to one-half of the Massachusetts carnations are exported to Southeastern states.

Naturally, air transportation would appear to be a logical service for a perishable commodity which requires speed, efficiency, and economy. The present overall volume of air traffic in flowers is not known, but it is substantial in some areas. Two indicators are available. A sampling study by the United States Department of Agriculture showed that of the total transportation of those replying, 3.3% had been by air in 1945 and 7% in 1952. A major airline has reported that flower shipments are its largest producer of airfreight revenue.

It is also natural that the rapid development of a service which is relatively new to both parties would run into many hurdles due to a lack of knowledge of each other's problem's. Human nature being what it is, each industry was being indicted by the other, in most cases unfairly and unnecessarily.

The suggestion was made that a continuing program of periodic discussions at the industry level might prevent misunderstandings from growing into unpleasant problems. Enthusiastic acceptance of both groups led to the adoption of such a program by Air Cargo, Inc., and the Society of American Florists.

The Society of American Florists is

(Continued on Page 22)

AIRFREIGHT — CUT FLOWERS
TERMS OF ACCEPTANCE BY AIR CARRIERS
WILL BE ACCEPTED, ACCORDING TO LENGTH OF BOX, AS NOTED

AIR CARRIERS	Under 36" in Length	37"-44" Inclusive	45"-48" Inclusive	49"-60" Inclusive	Over 60 Inches
American Airlines	Yes	Yes	Yes	Yes	Yes
Bonanza Air Lines	Yes	Yes	No	No	No
Braniff Airways	Yes	Yes	Yes	Yes	Yes[1]
Capital Airlines	Yes[4]	Yes[6]	Yes[6]	Yes[6]	Yes[1]
Colonial Airlines	Yes	Yes	No	No	No
Continental Air Lines	Yes	Yes	Yes	Yes[1]	Yes[1]
Central Airlines	Yes	No	No	No	No
Delta—C & S Air Lines	Yes	Yes[2]	Yes[2]	Yes[1]	Yes[1]
Eastern Air Lines	No	No	No	No	No
Frontier Airlines	Yes	Yes	Yes	Yes	Yes
Flying Tiger Line	Yes	Yes	Yes	Yes	Yes
Mohawk Airlines	Yes	No	No	No	No
National Airlines	Yes	Yes[2]	Yes[2]	Yes[2]	No
Northeast Airlines	Yes	Yes	Yes	Yes[2]	Yes[2]
Northwest Airlines	Yes	Yes[2]	Yes[2]	Yes[2]	Yes[2]
New York Airways	Yes	Yes	Yes	Yes	Yes
Piedmont Aviation	Yes	No	No	No	No
Pioneer Air Lines	Yes	No	No	No	No
Slick Airlines	Yes	Yes	Yes	Yes	Yes
Southwest Airways	Yes	Yes	Yes	Yes	Yes
Trans Texas Airlines	Yes	Yes	Yes	Yes	No
Trans World Airlines	Yes	Yes[5]	Yes[5]	Yes[1]	Yes[1]
United Air Lines	Yes	Yes	Yes[3]	Yes[3]	Yes
Western Airlines	Yes	Yes[3]	Yes[3]	Yes[1]	Yes[3]
West Coast Airlines	Yes	Yes	No	No	No

Explanation of References:

[1] Accepted for transportation on all-cargo aircraft only.

[2] Accepted for transportation on all-cargo aircraft or on Boeing *Stratocruiser* aircraft only.

[3] Will not be accepted for transportation on DC-3 aircraft.

[4] Will not be accepted for transportation on *Lodester* aircraft.

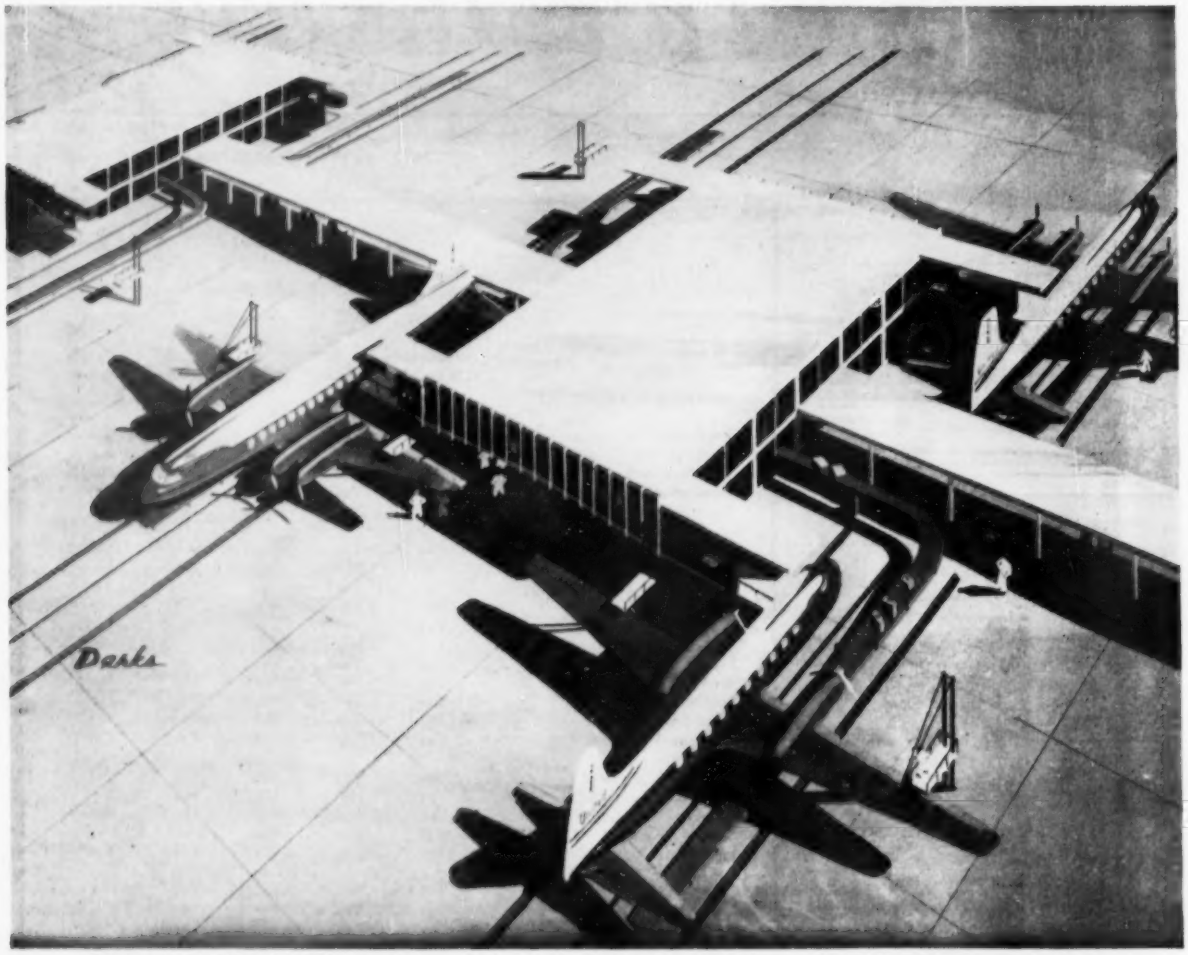
[5] Will not be accepted for transportation on Martin aircraft.

[6] Will not be accepted for transportation when destined to Elizabeth City, Rocky Mount, Raleigh, Greensboro, Winston-Salem, Charlotte, Hickory or Asheville, N. C., or to Memphis, Tenn.

Extracted from the Official Air Cargo Station Directory, issued by Air Cargo, Inc.

Air shippers demand speed, and United Air Lines' recently tested Airdock bids fair to recapture most of those precious minutes lost on the ground.

Ground Handling



ARTIST'S CONCEPTION of United Air Lines' Airdock. Central building houses cargo work center and passenger facilities.

YOU CAN'T SELL air speed effectively, especially on short hauls, if the ground portion of the total transportation time is slowed by archaic procedures. Certainly not the least of the problem are the methods of loading and unloading cargo and passengers.

Now, sparked by W. A. Patterson, president of United Air Lines, the carrier has come through with an Airdock which initial mock-up tests show can empty one of United's DC-6Bs of freight, express, mail, baggage, and passengers in four minutes. On-loading would be accelerated, too.

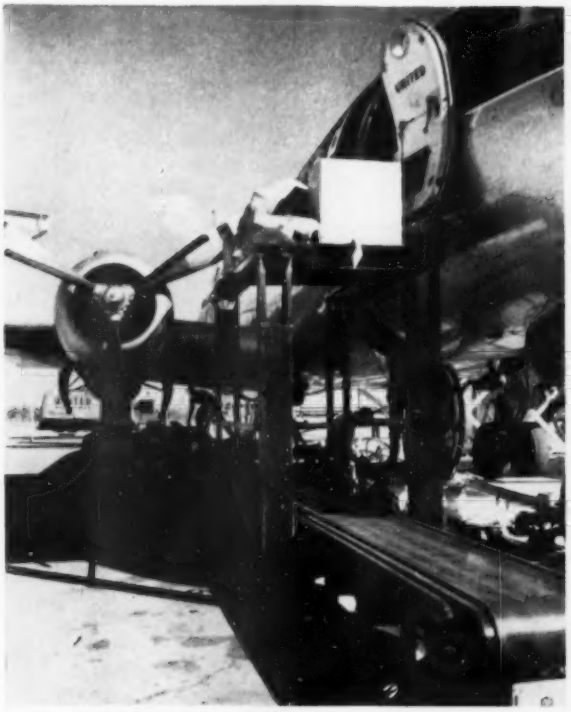
Not only will a fully installed Airdock step up the pace of loading and unloading, tests show, but it would do away with "conservatively" 70% of the mobile equipment now used (gastrucks, baggage carts, tractors, power units, oil and ADI carts, air conditioning units, sanitation carts, mobile belt conveyors, and passenger loading stands).

The full-scale mock-up of the Airdock was tested at United's Denver Operating Base. Developed by Don Crichton, the airline's airport engineer, who came through with the original design, the facility's planning details were handled by H. C. Warrington, staff superintendent-research. The project was under the general supervision of D. F. Magarrell, vice president-transportation services, and Seely V. Hall, assistant vice president-facilities.

Principal idea of the Airdock is that it brings the plane to the servicing

(Continued on Page 24)

Receives A Boost



CONVEYOR BELT, above left, in mock-up of Airdock swiftly unloads freight, express, mail, and baggage.

REVOLVING TABLE, above, receives cargo and baggage from conveyor while handlers swiftly sort items. Direction of belt can be reversed when plane is being loaded.

PASSENGERS, at left, leave DC-6 via bridge of Airdock. Loading stand, which must be pushed to cabin door, has been eliminated by this method.

The Hercules Story

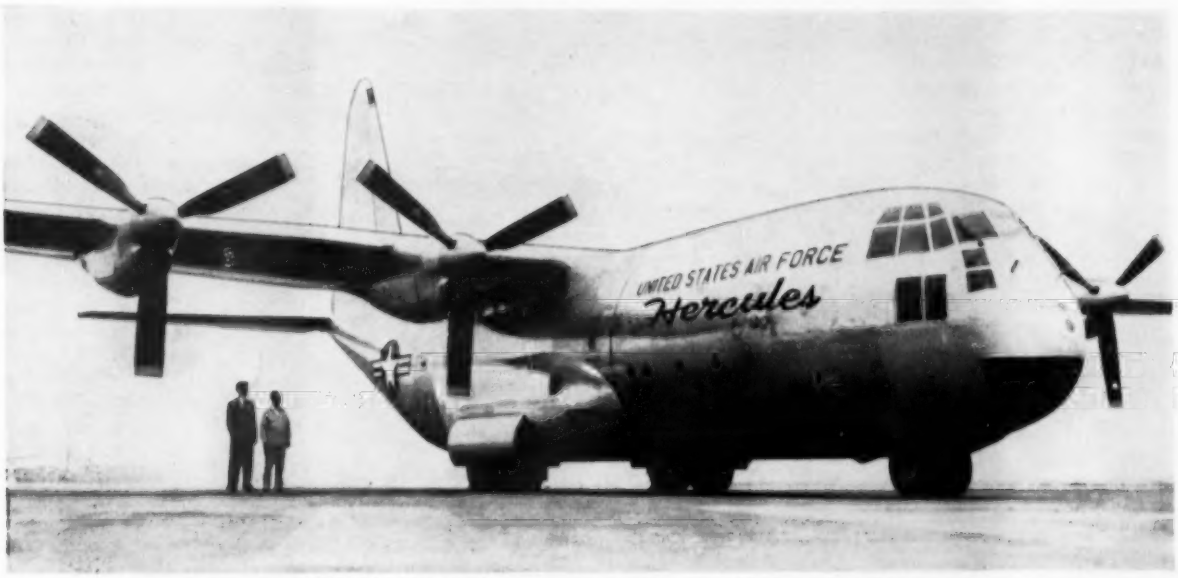
By ROBERT W. MIDDLEWOOD

Chief Engineer

Georgia Division, Lockheed Aircraft Corporation

SAYS THE AUTHOR: "Where the military and the civilian needs are so nearly parallel with regard to a cargo mobility, there is surely room for some overall consideration. The dual concept of a basic military-civilian cargo transport is an approach to a peacetime capability. The Lockheed C-13A *Hercules* is an airplane which puts us into the middle of this picture. It is an airplane which has the capability of future growth as required in handling its military missions. This same airplane has a growth potential in the cargo field which will offer to the logistics, or to the civilian operator, a direct operating cost of 4¢ per ton-mile as compared to present military cargo airplane of 6¢ per ton-mile. We believe in cargo transportation by air and are determined to help further its case."

FIVE-THOUSAND-GALLON TRUCK and trailer being backed into the airfreighter during mock-up loading trials at the plant.



LOCKHEED'S C-130A *Hercules* now in production at Marietta, Georgia.

WE ARE ON THE THRESHOLD of a tremendous expansion of cargo movement by air. The C-130A military transport has earned a place in the future national growth potential because of careful attention to its development by the Air Force, the Army, and the manufacturers.

The full realization of the need to move substantial quantities of cargo and large groups of personnel by air within the military establishment is now represented by a firm Defense Department policy.

Until recently, transportation of people largely dictated the design of the transport airplane. Mail was the only cargo for many years. Anything else that moved by air was either luxury or an isolated high-priority case. By the time we entered the last World War, we found ourselves sadly lacking in airplanes capable of carrying cargo efficiently.

The available transports were forced to carry loads the designer never dreamed would be put into his airplane. He found himself reinforcing the airplane's structure to carry payloads far in excess of the original design. Necessity forced operations people into conditions which only a few years previous would have been considered impossible.

The now famous Hump Operation from India to China brought into focus all of the shortcomings of personnel transports when used as cargo aircraft. In spite of this, it did stimulate postwar expansion of air freight. As most of us are aware of the many air freight operators who entered this field at the end of the war, only a very few have survived. Undoubtedly those that failed can point to the fact that converted passenger airplanes were improper tools with which to work.

The Berlin Airlift added impetus to the growing realization that an airplane must be designed as a cargo vehicle if the job is to be done economically. There are now definite military requirements for transport aircraft to be designed either primarily for cargo or primarily for personnel, without sacrificing the flexibility required to meet wartime exigencies and the vagaries of totally unforeseen circumstances. The Military Air Transport Service recently enunciated this philosophy at the National Turbine Powered Air Transportation Meeting in Seattle.

Future Military Posture

Throughout this country groups of analysts have been attacking various portions of the air logistics complex. Most of the work bears on the development of our future military posture. A few groups are in hopes of a logistics system synthesis by applying the scientific method to the art of logistics. All are dedicated to the job of evolving an efficient system of rapid transportation of large segments of our military establishment. This new military requirement for exceptional mobility during the present transitional phase in the international situation means air mobility.

The air transportation industry is quite aware of its responsibility in the new era. Aircraft manufacturers and airline operators are cognizant of the need to implement a mobilization plan which will have a logistics transport system in being during peacetime. The existing cargo-carrying capability within the airline industry is incompletely developed.

Major Air Force, Navy, and Army commands have redefined their logistics operational requirements to suit the missions assigned to them. More specifically, we are concerned here with the C-130 as it is presently being built for the Air Force Tactical Air Command. We will examine the military requirements leading to the initial development, its present capabilities, and its growth potential as we at Lockheed envision the development of cargo movement.

The introduction of nuclear weapons into tactical warfare has forced combined air-ground operations to change. Ground units no longer can be concentrated in an area for appreciable lengths of time. They must be able to move rapidly through the air in almost all combat situations. In defining this high degree of mobility, the Air Force classified its required transport capabilities into light, medium, and heavy categories in order to match the various conditions in combat situations. Actually, this definition determines size classes and gives each class some mutual overlap, thus affording maximum operational flexibility. The C-130 falls into the medium size.

The Tactical Air Command requirements for a new military medium cargo

airplane were formalized in early 1951 by the issuance of a type specification and an invitation to several contractors to submit proposed designs suitable for the air transportation of personnel and material delivered by parachute or landing at hastily prepared airstrips.

It was rather obvious from the beginning that this airplane would need to reflect the best judgment and service experience within both Air Force and the Army if we were to succeed in the development of more than merely an acceptable airplane. Increased performance capabilities commensurate with the evolution of the new military doctrine demanded that we work closely with the Tactical Air Command, Army Field Forces Board No. 1, Joint Air Transport Board, and Joint Airborne Troop Board, as well as the usual Air Force laboratories and procurement offices. By the middle of the year we received the contract authorization to go ahead with the development of a prototype.

One of the early phases of an assault operation requires the use of an airplane capable of aerial delivery of such equipment as bulldozers, road graders, trucks, and howitzers to forward areas. Paratroopers must be released into drop zones with an acceptable minimum of dispersion. Then, after hasty preparation of airstrips, the airplane lands with equipment too large to airdrop, with more supplies and with troop reinforcements. The return trip evacuates the battle casualties.

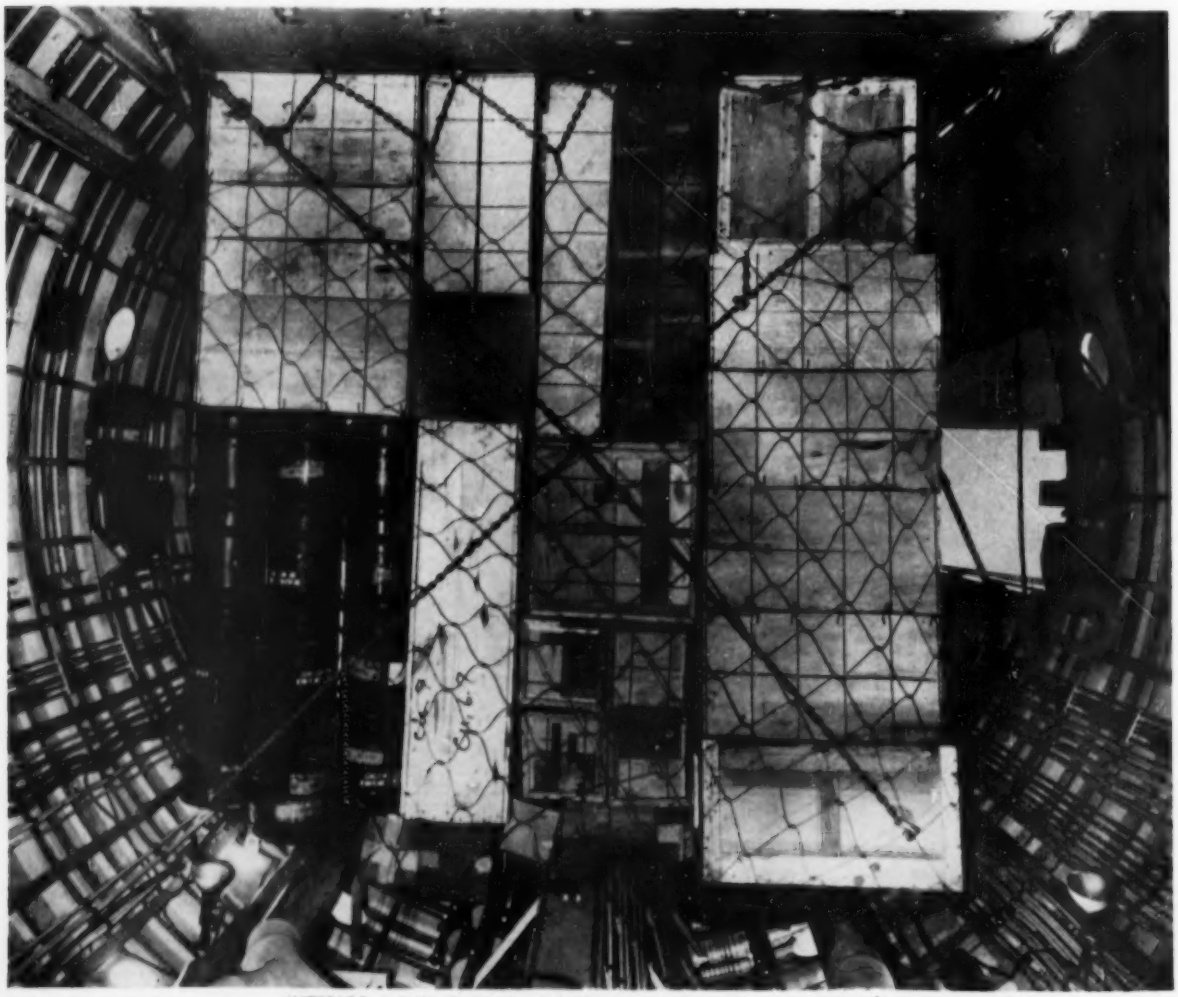
New Requirements

The new performance requirements defined substantial improvements in the existing transports. One-engine-out capabilities over the drop zone were increased by factors of 1.5 to 2.0. Dependable controllability and stability at low speeds were essential. Design payload-range capabilities were multiplied by a factor of eight. Moreover, assault airplanes require exceptional take-off and landing performance.

Equipment and structural demands showed improvements of similar magnitude. Throughout the operating range, an 8000-foot pressure altitude for both crew and cargo compartments were now required. An integral ramp and rear door operable in flight for heavy equipment drops were specified. The limit flight load factor was increased to three. Excellent crew visibility must be provided. The clear cargo volume asked for resembled a railroad box car (40′ x 10′ x 9′). The cargo floor had to be at the level of standard truck beds. The landing gear should be capable of enabling airplane operation in fields of clay, sand, or humus.

This is the airfreighter the Air Force asked us to develop which it felt could

(Continued on Page 25)



INTERIOR VIEW of the C-130A showing tie-down of assorted freight.

BUENOS AIRES: Participants in Panagra's first Trade Tour

Recently Panagra completed its first month-long Trade Tour of nine Latin American countries. Business executives from different parts of the United States covered some 12,000 miles in an effort to study economic conditions in the various countries and the opportunities for increased trade. So successful was the initial Trade Tour that Panagra has scheduled another one for April 2. In addition, the Chambers of Commerce of the cities of Detroit, Pittsburgh, and Portland, Oregon, are set to make tours during 1955. *Air Transportation* asked the participants in the airline's first international fact-finding operation for their impressions of the trip. Here five business executives have their say.

"We Flew There and Saw for Ourselves"

Impressions of Latin America by

Frank Bryson, President, Steelco of Miami, Inc., Miami, Florida

Don E. Golay, President, Farmer Feeder Company, Inc., Cambridge City, Indiana

Colonel Robert C. Jones, Senior Partner, Jones, Kreeger & Hewitt, Washington, D. C.

James Neville McArthur, President, McArthur Jersey Farm Dairy, Inc., Miami, Florida

Blanche G. Schwartz, Partner, Schwartz & Bogart, Cleveland, Ohio

QUITO: U. S. Ambassador to Ecuador, Sheldon T. Mills, provides first-hand information on business prospects in that country

FRANK BRYSON:

". . . It is my feeling that probably the best thing to promote air transportation as a means of conducing better relations, less red tape would be required for the average traveler . . . I feel that if the airlines brought more pressure to bear in the various countries along these lines, many more people would use air transportation as a means of conducting international trade, and by so doing, increase the trade between the various countries. This applies not only to the States but among the Latin (American) countries . . . .

"From my own standpoint regarding future trade in the Latin (American) countries, I feel, after weighing and digesting what I saw and learned, that I will probably make another trip to two or three countries I visited where the people themselves impressed me as being the most desirous of establishing better trade relations with the States, and on a more sincere basis. I particularly refer to Panama, Ecuador, and Bolivia."

CALI: Inspecting one of Colombia's biggest paper box factories

DON E. GOLAY:

"Many thoughts come to my mind with reference to trade with these countries. Equipment, such as ours, has limitless possibilities . . . . The free zone in Panama should help many people in doing business with the Latin American countries. However, in our instance I don't believe it is the answer. Problems of inflation were extremely noticeable in many countries, also the hazards of same were very pronounced. Another noticeable contrast was the very ultra-modern construction in many countries . . . I feel that South America has many trade opportunities for the future. We plan on giving more thought to our friends and potential customers in this area."

ROBERT C. JONES:

"I am convinced that there is an enormous market in South America for our products. There is an acute shortage now in many of these countries of electrical generating equipment, heavy machinery, modern farm equipment, automobiles, etc., with the consumer household appliance market practically untouched. They have many raw materials which we need and I believe we should have stronger ties with our neighbors of this hemisphere which would result in a better understanding and better trade relations between our peoples which would be naturally profitable.

"I strongly believe that this situation should be treated as an 'overall problem,' rather than with individual countries, and the way to meet it, in my opinion, is through the establishment of a 'Central Bank' for the Latin American countries which would provide for stabilization and convertibility of their currencies. The cause of unrest and occasional government upsets in some countries is due, I think, to the instability of their currencies. Small individual loans made spasmodically to some countries will not improve the general situation in Latin America. A Central Bank will save many Latin American countries from bankruptcy and eventually, Communism, and will help our own export markets tremendously."

J. N. McARTHUR:

"Our South American trip started with the stop at Panama and Colon. Panama's economy is affected greatly by the Panama Canal. Colon, in the Free Zone, is destined to grow and develop industrially due to its possibility of serving commercially between North and South America. A number of American industrial concerns have established branches in the Free Zone in order to have a great opportunity for service and acquaintance. Cali, a city in the southeastern part of Colombia, is developing rapidly industrially. They have large manufacturing establishments owned by American interests that are contributing to satisfying the demand for these articles in Colombia. Some of these factors are: Celanese, Goodyear tires, paper, cement, drugs and coal mines. . . .

"Between Quito and Lima, the cities and countries badly need heavy investments of foreign capital. They are large importers of manufactured goods. La Paz, capital of Bolivia, needs outside investment. They are large exporters of tin. Buenos Aires, with a population of 3,500,000, is surrounded by a fine agricultural area. They are heavy importers of manufactured

(Concluded on Page 20)

Shipping to South America?

✓ note this

- 12 DC-6 flights weekly from Miami. 2 additional flights from Panama.
- Large or small shipments to Panama*, Colombia, Ecuador, Peru, Bolivia, Chile, Argentina.
- For reservations call Panagra's U. S. Sales Agent, Pan American World Airways, or your Freight Forwarder.

*Miami to Panama over PAA's route.

PAN AMERICAN-GRACE AIRWAYS PANAGRA

Corporate Flying . . .

• Business flight continues its steady upward course. According to statistics just released by the Civil Aeronautics Administration, business aircraft registered a total of 3,900,000 hours in the air during the year 1954. This is in contrast to the previous record of 3,326,000 hours flown in 1953. It is significant that the business flying hours topped the revenue hours flown by all the United States scheduled domestic and international airlines by more than 700,000 hours.

Scheduled Airline Safety . . .

• Safety interests everyone. And it's good news when it can be reported that another record year in safety was chalked up in 1954. With only 16 passenger fatalities, the passenger fatality rate in scheduled operations fell from 0.41 per 100,000,000 passenger-miles to 0.08. At the moment there are no 1954 railroad passenger safety figures available. However, comparison with the railroads' passenger safety record of 1953 shows the airlines to be safer. In 1953, the railroads reported 0.16 passenger fatalities per 100,000 passenger-miles.

NBAA Committees . . .

• Henry W. Boggess, board chairman of the National Business Aircraft Association, Inc., and aviation director for the Sinclair Companies, has appointed four committee chairmen to provide a careful study of NBAA policies, organizational structure, and general activities. This, he said, is the result of "the rapid growth and development of business flying during the past year." Committee chairmen are: Cole H. Morrow, J. I. Case Co., Technical Committee; Walter C. Pague, ARMCO Steel Corp., Awards and Convention Committee; Gerard J. Eger, International Harvester Co., Administrative Committee; and Joseph B. Burns, Fuller Brush Co., Reorganization Committee.

Nonsked Airline Safety . . .

• The irregular air carriers, too, are showing an exceptional passenger safety record. At the end of the year the nonskeds were completing their 16th month of operation without a passenger fatality. According to H. B. Johnston, president of the Aircoach Transport Association, more than 40 independents are operating at the present time. These flew an estimated 1,300,000,000 passenger-miles last year.

Owens-Illinois DC-3 . . .

• The Owens-Illinois Glass Company, Toledo, Ohio, has added a new DC-3 to its corporate aircraft fleet of two twin-engine planes which includes a DC-3. The new transport was furnished and the work done by Remmert-Werner, Inc., of Toledo. The cabin has facilities for 14 passengers including three conference groupings of seats, folding tables, dictaphone, adjustable desk, automatically controlled heat, and extra large cabin and picture windows at eye level. The aircraft is equipped with the latest in communications and navigation electronics. The average speed of the plane exceeds 200 miles per hour.

Designing Smith Aircraft . . .

• The L. B. Smith Aircraft Corporation, Miami, has signed an agreement with Butler and Zimmerman, Inc., well-known industrial designers with headquarters in New York for the exclusive rights to the services and resources of the latter firm for business aircraft. Herrol Bellomy, executive vice president and general manager of the big modification and conversion center for business aircraft, said that the deal will enable Smith "to give the business and executive aircraft owner the specialized, coordinated service that has been so badly needed."

WE FLEW THERE

(Continued from Page 18)

goods; automobiles, machinery, minerals and oil. Sao Paulo is in the midst of a great building boom. Approximately 200 miles from the Atlantic, it is in the middle of a coffee production area. Sao Paulo contributes 51 percent of the revenue of Brazil. Caracas is the wealthiest city in South America. Royalty from oil brings it $5,000,000 daily. They are large exporters of iron ore. Eleven percent of the iron ore used in the U. S. is imported from Venezuela."

BLANCHE G. SCHWARTZ:

"My general impression is that an almost incredible amount of building is in progress. Inquiry indicates that in some countries this is dictated by confidence in the country's expansion; in other countries it is merely a 'flight of capital' into something tangible, since currency cannot be sent out of the country, and the nightmare of devaluation confronts the man with savings.

"Much of this tremendous amount of building gives evidence of low wage rates which permit substituting human labor for machine work. In one city, I watched a painter working on a business building. One man stood on the sidewalk and held the ladder; at the second floor, another worker held the ladder, where it was roped to a second section, and higher up, on this second section, the third painter plied his brush in each direction, as far as he could reach from the ladder. This performance, devoid of such items as a painter's scaffold, proceeded until the area was completed. This was rather typical of the leisurely working methods prevailing."

THE BIG PUNCH

(Continued from Page 9)

probably has had some effect. Both have continued separate operations.

Seaboard & Western Airlines, transatlantic all-cargo carrier, which has been battling for a certificate since 1947, and was recommended for one by a Civil Aeronautics Board examiner 13 months ago (no word since then), almost doubled its commercial cargo ton-mile record last year. This year Seaboard will compete with a newcomer in transatlantic air freight carriage, Airwork, Ltd., British all-cargo carrier. Armed with a foreign air carrier permit, Airwork is expected to begin scheduled operations on a two-a-week basis between London and Montreal and New York.

The International Air Transport Association, whose 71 member airlines hauled 77% of the world's air cargo, reported an estimated total of 527,000,000 ton-miles of cargo flown in 1954. This figure topped the 1953 total by 4%.

Excluding Soviet Russia and Red China, which do not issue such statistics, the world's air carriers flew 716,000,000 cargo ton-miles last year. It was a boost of 3% over the previous year. The International Civil Aviation Organization, which is authority for these new figures, indicated that air cargo ton-mileage has shown an increase of 283% between 1947 and 1954, while passenger-miles during this period rose 172% and mail ton-miles went up 148% ton-miles. ICAO represents 61 nations, and its statistics cover only the scheduled services of the domestic and international airlines.

Juan T. Trippe, president of Pan American World Airways, in his year-end statement, pointed out that while company cargo revenue increased 14%, the rate of increase across the Atlantic was 25%. He said that "the maximum potential of the cargo market was not realized," and he lashed out at "the transatlantic carriers and certain interested governments" who hold "divergent opinions concerning the extent to which, if any, air cargo rate reduc-

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Hamburg, Stuttgart, Geneva, Zurich, Athens

registered irregular common carrier

tions should be made available to shippers." If they can reconcile their differences and major cargo tariff reductions are made effective, Trippe said, Pan Am will operate daily all-cargo flights across the Atlantic before another new year comes along. He stated that his company is studying "the large, fast, turboprop cargo aircraft now being designed to meet the requirements of the national defense." Trippe added that when these become available, shippers will receive the benefits of superior and cheaper cargo service.

Panagra's vice president-sales and traffic, Edward G. Bern, basing his optimism on the more than 10% increase in cargo traffic for the first 11 months of 1954, foresaw a banner year in 1955. He credited intensified selling with the fact that Panagra chalked up its biggest Christmas cargo traffic season in company history.

Seaboard's executive vice president, Arthur V. Norden, declared that "our economic forecasts for 1955 indicate that the curve will move up in an impressive fashion."

Eastern Air Lines, long out of the cargo picture, has decided to reenter it. According to Richard Gilbert, cargo sales manager, Eastern will inaugurate a hot sales and promotional campaign. Eastern's current revenues from cargo account for only 1½% of its total revenues. Shippers have adopted a wait-and-see attitude.

Most of the airlines' individual year-end reports were not received by this writing, but one of those received from a domestic trunkline spread a story of new records and profits over a three-page news release, *and neglected to mention a single word about cargo.*

• • •

Recent Cargo Reports

American: Despite one-month pilot strike, a 4% cargo revenue increase over the previous year was reported.

Avianca: International and domestic flights hauled 226,000,000 pounds in 1954, an increase of 26,000,000 over 1953.

BOAC: Transatlantic kilos of cargo between New York/Montreal-London, reached 1,063,530 last year. In 1953 these routes produced 1,046,463 kilos of air cargo.

Flying Tiger: November, last month reported, showed 5% increase over the year before in domestic revenues.

Northwest: Freight ton-miles in November, 1954, were 30.4% above November, 1953; express ton-miles jumped 64.54%; and mail ton-miles rose 71.07%.

Pan Am: Cargo revenue up 17% in 1954, with the last month estimated. Ton-mile figure given was 59,083,300.

Panagra: During the first 11 months of the past year cargo traffic increased by more than 10%.

Riddle: November was another good month. Running nearly 3,500,000 pounds ahead of the previous November, it helped to give the carrier a total of 17,450,916 pounds for the first 11 months, as compared with 13,952,244 pounds in the January-November, 1953, period.

Seaboard: An increase of close to 100% in commercial transatlantic cargo ton-miles is reported for the year.

Trans-Canada: Freight ton-miles rose 35% during 1954 to a mark approximating 8,340,000. Express was up 10% with a record of about 1,808,000 ton-miles.

TWA: Domestic freight ton-miles, at 20,904,000 rose 10.6% over 1953. International freight ton-miles, at 8,783,000 showed a 10.3% increase. Express ton-miles (this is all domestic), which reached only 6,900,000, represented a drop of 9%. Overall domestic cargo increase was 4.6%.

United: Estimated freight ton-mile increase in 1954 estimated at 21% over 1953. Figure reported was 33,991,000 ton-miles. Express, with 10,656,000 ton-miles rose 1%.

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LET'S TALK IT OVER

(Continued from Page 11)

the national trade association of the florist industry representing the industry as a whole—producers, wholesalers, retailers. It is the accepted spokesman for the industry in all affairs at the national level. Eighty-three national, regional, state, and local florist associations are directly affiliated with the society.

The Traffic Committee of the society was represented at the meeting of the Cargo Advisory Board of Air Cargo, Inc., held last September 30 in Miami, Florida. The balance of this article will discuss the major problems presented by the society, together with the conclusions reached.

It is inherent in most industries that individual firms have their own ideas about sizes and construction of their shipping containers, while at the same time it is well known that some industries have made substantial savings by bringing about some standardization. It is recognized that this situation results in inefficiency in handling and stacking of shipments in a plane.

The SAF has developed a questionnaire, in cooperation with ACI, which was mailed to approximately 300 flower shippers on the last day of 1954. It is anticipated that it will result in an approximation of the number of boxes of flowers shipped annually by air, the various sizes used, the types of construction and insulation as well as the kind of refrigerants used inside the boxes. The shippers are also being asked to comment on the actual handling of flower shipments at terminals and in transit and to express such opinions that they may have with respect to shipping flowers by air.

The complete results of this survey will be studied jointly by ACI and SAF with the expectation of making detailed recommendations of mutual benefit.

Annoyances

In spite of the fact that ACI publishes detailed information for the use of agents at all terminals, there are many annoying instances of a shipment being accepted only to find that at a transfer point enroute the box cannot be taken by the continuing airline because of space limitations of its equipment. ACI will emphasize to all agents the importance of checking shipments before acceptance. It also has supplied the Society of American Florists with a composite chart of the limitations of all its member airlines which has been reproduced by SAF and mailed to all of its shippers to help them avoid transfer difficulties. As changes may be made in these restrictions, these shippers will also be notified.

The subject of embargoes is one that is greatly misunderstood in the florist industry and, therefore, has been the cause of considerable unpleasant friction. It is true that it is easier to understand an embargo in time of a national emergency, and definite steps have been taken to explain such situations to flower shippers.

On the other hand, it is quite difficult to understand so-called temporary embargoes, especially when they are maintained for a period of years rather than months. In at least one instance an airline actively promoted the development of a new market for the producers in a particular area. Although it was a market which depended on air transportation and had become quite profitable to the producers, the airline suddenly embargoed flowers at the beginning of a shipping season. *In spite of the fact that it was*

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announced as a "temporary embargo" due to an emergency, it has now lasted for three years.

ACI has pointed out that as an association it is not in a position to control such individual actions of any of its members.

The florist industry is perhaps unique to the extent that a rather considerable amount of flower buying is done on a "needed tomorrow for a special occasion" basis. This makes it quite vital to the purchaser to be informed if he is not going to get his flowers on time so that he can have the opportunity of picking up substitutions for his requirements locally.

ACI points out two difficulties—the first is the matter of the added expense for the telegram or telephone call, and second is again the problem of alerting all agents to comply. It is the belief of SAF that the consignee would be willing to pay for the message, but nothing final has been arrived at on this problem.

Conflicting Procedures

It is difficult for florists to understand why, on what appear to be identical circumstances, one airline will pay a claim and another airline will refuse it. It is also a matter of record that on seemingly identical claims the same airline has paid one and refused another. SAF has been asked to provide details of specific cases for presentation and discussion with the Claims Committee of ACI at its next meeting.

It is recognized that much of the damage to flowers is caused by the way they are handled during the loading, unloading, and delivery. This is undoubtedly due to a lack of information on the part of the handlers about the characteristics of the commodity.

Several years ago, United Air Lines developed an educational program in cooperation with individual wholesale florists at all of its major cities. Boxes of flowers would be packed before an audience of cargo handlers, then dropped on the floor, and opened to show them the damage that had been done. The effect on flowers which were left outside and unprotected in severe heat and cold was also carefully explained. It is the opinion of all concerned that this program has resulted in definite savings. United has generously offered to make available all the details of its demonstration program, and this is being used in the development of a joint industry program by ACI and SAF.

It is hoped that it will be possible to inaugurate a continuing program of demonstrations for all airline cargo handlers at all the major airports.

As soon as the details have been perfected, ACI will promote the plan to its members and as meetings are scheduled, SAF will arrange for the demonstration by local wholesalers.

The florist industry is extremely pleased at the auspicious beginning that has been made in this enlightened program at the industry level. The relationship between the headquarters staffs of the two associations has been a most cooperative and pleasant one. The potential effect of each industry upon the other for future development is not possible to measure at this time. All that can be said is that the *per capita* use of flowers in all European countries — particularly in England, Holland and Sweden—is many times that of the United States. No one will say that the consumption in this country will not eventually catch up. The extent to which that is achieved will depend in a large measure on speedy, efficient, and economical transportation. Almost alone this can assure wider distribution of a greater increase in production.

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GROUND HANDLING

(Continued from Page 12)

facilities, rather than the other way around which is the universal procedure today.

As the Airdock stands today—as a mock-up it has only a working minimum of parts—it consists of a passenger bridge, a sorting table for cargo and baggage, a starboard wing fueling boom, power-driven conveyor belt, three hydraulic cargo lifts, a winch and gasoline engine, steel guide trench and positioning rig. In addition there are three carts to handle preloaded, preweighed outbound cargo.

Here's a typical unloading operation:

The plane parks with its tail toward the Airdock. Ramp workers slip the yoke of the positioning rig over the nose wheel and attach a direction-corrective arm under the port wing. The winch starts up; the plane is drawn tail-first in the Airdock.

Passengers begin to move out of the plane at the same level as the cabin door, while workers simultaneously unload cargo and baggage on a conveyor belt which runs parallel to the starboard side of the fuselage. One hundred and forty feet long, the belt travels at a rate of 120 feet a minute.

Freight, express, mail, and baggage flow onto a revolving "Lazy Susan"-type table located in the cargo work center of the Airdock. As passengers walk down the overhead bridge, workers remove baggage for claiming. ("A finished installation," says United, "would have additional conveyors to carry away mail, express, freight, and baggage form the sorting table.")

Loading

Comes the loading:

The direction of the conveyor belt is reversed. This time it moves planeward. Three cargo- and baggage-loaded carts ride to the plane on the conveyor belt. The first cart contains items to be stowed in Pits 1 and 2, the second for Pit 3, and the third for Pit 4. When they arrive below their specified locations, hydraulic lifts are automatically tripped off, rising to the proper height. Elevation is controlled by cargo handlers.

Why haven't time studies of outbound servicing operations not been undertaken? Because, says United, this phase of mock-up testing did not include the building of outlets for gas, oil, and other supplies. It was pointed out that during the tests food containers were elevated to the passenger bridge by fork lifts. In the finished Airdock a hydraulic hoist would perform the job.

The mock-up was not built exclusively for United's DC-6Bs. It will accommodate DC-6s, DC-7s, and Convairs. With respect to the latter aircraft, deplaning passengers have to leave by the stairs carried aboard the plane rather than by the bridge.

What has been the company reaction to the Airdock? Said Hall:

"Tests have convinced us that the Airdock has possibilities which merit complete development and the construction of a prototype. We have found that the installation offers faster cargo and baggage handling, greater comfort and convenience to passengers, and improved working conditions for ramp servicemen and cargo handlers.

"As a facility at a major terminal, the Airdock would do much to relieve ramp clutter. Conservatively, it would eliminate 70% of the mobile equipment presently used. Aside from savings in the purchase and maintenance of such equipment, additional economy would result from the fact that less ramp area would be needed for ground handling of aircraft.

"Passengers would be under shelter to and from the cabin door. They would not be required to climb or descend steep stands in open weather. Their baggage would begin moving out of the pits at the moment the plane halted in the dock. It would be en route to claiming areas when they reached ground level.

"An increase in safety factors is among our expectations. This would come through a reduction in mobile equipment and the use of underground installations. Opportunities for human error also would be fewer. Weather hazards would be minimized, since many ramp servicemen would remain under shelter at all times.

"The mock-up has demonstrated that

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the idea of an Airdock is practical from both economic and operational standpoints. We feel that it now can be fully developed. Engineering of additional elements, such as outlets for fuel and air conditioning, will begin shortly, aimed toward eventual construction of a prototype at a major terminal."

HERCULES STORY

(*Continued from Page 16*)

meet the needs peculiar to modern tactical air-ground operations.

Within these operational requirements, Lockheed engineers explored new avenues of design as well as the usual approach that a mature development group follows in its search of a configuration that has a high survival probability. Simplicity, reliability, and rugged construction became the primary factors in our design philosophy. Other prime objectives were economy of manufacture, operation, and maintenance.

The one-engine-out condition fixed the need for four engines. Because operational economy was a goal, we chose the turbo-prop engine for its long-range performance characteristics at high altitudes. The Allison T56-A-1 engine rated at 3750 ESHP combined with the Curtiss-Wright turbo-electric, full-feathering, reversible, three-bladed propeller met the requirements very satisfactorily.

The long range and high altitude factors meant a high aspect ratio wing. A cargo floor at truck bed level placed the wing high on the fuselage. We settled for a wing of 10 aspect ratio, 132-foot span, and 1745 square feet in area. A relatively conventional arrangement of cargo space, which includes troop seating and litter tiers, was evolved after design studies proved again that simplicity is a virtue. Wind tunnel tests solved the aerodynamics

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problem of fairing the aft fuselage containing the in-flight operable ramp and door. The flat, elliptical end section provided suitable stiffness for the empennage, expanded rapidly into a cone-shaped section, and faired into the primary fuselage smoothly. The overall fuselage length turned out to be 94.8 feet. The tip of the single vertical tail is 38.3 feet from the ground.

Soft-field tire flotation characteristics, smooth wheelwell profiles, and minimum structural weight all seemed to point toward a tandem-wheel arrangement of two large, low-pressure tires in fuselage side blisters for the main landing gear. The more conventional wing-mounted dual-wheel arrangement was considered, but finally discarded in favor of the tandem arrangement. The somewhat modified tricycle landing gear was a reality.

As the general arrangement began to take form, the empty weight settled at 57,500 pounds, a gross weight of 108,000 pounds with a design payload of 25,000 pounds. The alternate gross weight became 124,200 pounds with a much higher payload at acceptable, reduced load factors. These are some of the highlights during the design period of creating the C-130A airplane. Answers to the many questions took the time of engineers, analysts, planners, and production experts.

A Composite

All modern aircraft are a composite of a number of different materials, each fabricated by several different methods, in an effort to achieve maximum structural efficiency by utilizing each under conditions best suited to it. The C-130A cargo transport is no exception. In addition to conventional materials and processes, a number of new ones have been used to obtain increased performance and serviceability.

Metal bonding now allows us to use lighter gages. Approximately 100 thin-gage aluminum assemblies are in this airplane. Typical applications involve the joining of doublers and stiffeners to skins of wing and empennage trailing edge assemblies. The use of metal bonding has been restricted to relatively flat panels in order to minimize production problems during the period when shop techniques were being developed. Even so, a number of production problems arose and were solved by close coordination between engineering and manufacturing. The biggest factor in solving shop problems was the careful training of personnel in the preparation and handling of parts for bonding.

A newcomer in the aluminum alloy field, A78S-T, is extensively used in the C-130A. Most usage is in the form of plate and extrusions for primary structure, particularly integrally stiffened skins. Here the 7% increase in allowable stresses over 75S-T offers the best opportunity to reduce airframe weight. Approximately 210 individual A78S-T parts are designed into the airplane, a number of which weigh over 100 pounds apiece. It is believed that this constitutes the greatest usage of this material in any airplane being built today. The upper and lower surfaces of the entire primary wing structure are made from plate stock machined to provide integral stiffeners. The largest of these panels is 48 feet long. The cargo floor is made of a series of integrally stiffened extrusions and integrally stiffened machine parts.

High heat-treated steel in the 260,000 to 280,000 PSI range has been used in specific applications. Approximately 140 high heat-treat parts are now being used in each C-130A. These parts are made from 4340 steel, since it has been found that this material gives the best combination of mechanical properties. Typical applications include nose and main landing gear assemblies, latches and hinges for large pressure doors and special bolts. Careful process control is necessary on high heat treat parts. Practices which are acceptable for steels heat treated below 200,000 PSI are unacceptable in the higher ranges.

Weight Saving

Titanium, the other much discussed newcomer to the materials field, is used in the engine nacelles and flap skins. The titanium is commercially pure sheet since high strength was not a design requirement, while heat and corrosion resistance and formability were. Used as a replacement for stainless steel, we were able to achieve a 25% weight saving. About 300 pounds of titanium parts are in each airplane. As shop techniques develop and titanium alloy specifications become more settled, the alloys will also be used for both sheet metal and machined parts. The greatest deterrent to more extensive use of titanium is its present high cost, which restricts its use to those airframe components where it must provide several important advantages.

As the detailed design progressed, experience accumulated over the years from other Lockheed-built airplanes was supplemented by current developments within the aircraft industry. For instance, the desire for an integral ground heating, cooling, and ventilating system which was independent of the main power plants was fulfilled by

the use of an auxiliary gas turbine compressor. This, then, was also a source of high pressure air for pneumatic starting of the airplane engines. An air turbine motor which drives A.D.C. generator and emergency hydraulic pump could be operated by air from the same auxiliary power source or by air bled from the engines.

Proven hydraulic power boosts are in all three of the primary airplane controls which provide excellent maneuverability through a wide range of speeds. As added insurance against loss of hydraulic pressure, all boosters have two separate and independent hydraulic systems, each of these systems, which we have labeled "the boost system" and "the utility system" is pressurized by two hydraulic pumps. The boost system pumps are on engines one and three, while the utility system pumps are on engines two and four. Any one pump can operate all three boosters under all normal flight conditions. The utility system also supplies pressure for landing gear and flap operations, for brakes and for nose gear steering. Although we feel that the probability of complete booster failure is quite low, the airplane can be controlled in all flight conditions by means of independent electrically-operated trim tabs which can be energized by the D.C. generator or even by the batteries. Actually, some measure of control is possible with pilot effort, particularly at low speeds.

Thoroughness

This rather detailed explanation is given as an example of the thoroughness required in the design of modern airplanes. We have no qualms about the safety of the airplane when it is manned by crews specifically trained to appreciate the nature of their tasks.

Thorough analysis of crew functions determined the need for a grouping and selection of equipment which gradually evolved into a rather conventional arrangement of flight crew stations without any sacrifice in operational effectiveness. Inherently, the single power control lever for each turbo-prop engine necessarily led the way to further simplification. For instance, we have fuel and electrical control panels designed to serve as animated flow diagrams we hope will contribute to operational safety.

We have briefly discussed some aspects of performance and flying qualities. A comparison between the C-130A and existing military cargo carrying transports shows how much we were able to improve on the minimum requirements by careful attention to the many facets of detail airplane design. Predicted average cruise speed turns out to be 20% faster; normal power, ceiling and rate of climb are 35% higher; normal power, one-engine-out ceiling and rate of climb are respectively 35% higher and 55% faster; take-off distance with maximum power is 25% less; and finally landing distance, using brakes only, shows a 40% decrease. Range and payload factors formed the keystone design parameters.

The early hours of flight testing validated our predictions satisfactorily. The airplane, even with its relatively larger size and weight, has the flying qualities of a much smaller airplane. Large airplanes are usually slower in responding to the pilot's controls because of their larger inertias. The control forces on the C-130A are very light and even at low flying speeds, the combination of light forces with high inertia seldom gives the pilot any impression of sluggishness. There is always sufficient control.

Operating Costs

One of the vital measuring sticks used by both the builder and the user of aircraft is the analysis of operating costs. Each has evolved his own set of formulae by modifying those issued by the Air Transportation Association. We can apply our own modification of the ATA formulae and show 8¢ per ton nautical miles for the design gross weight condition and 5.5¢ per ton nautical mile for the alternate takeoff gross weight condition. Or, we can use those issued by Project Rand and come up with 6¢ per ton nautical mile for the C-130A design range, normal payload, and limit flight loads factor of 3.0. Suffice it to say, we can now predict that the airplane as presently being built is in the low direct operating cost class. Further, we have reason to believe that the indirect operating costs will be less than half of the direct operating cost, inasmuch as the C-130A can be loaded from docks, similar to trucks, or directly from trucks.

This "loadability" characteristic extends into the primary fuselage design. We have already noted the ready access through the rear ramp and door which exposes the entire 9′ x 10′ cross-section of the loadable volume. The forward 88″ x 73″ door allows for loading from two ends thus shortening cargo handling distances. In common with other aircraft manufacturers, we have been, and are still asking ourselves some rather searching questions regarding the nature and amounts of present and potential air cargo in order that our design would better solve diversified logistics requirements. Airplane de-

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sign as it relates to loading and securing of cargo, as well as efficiency of space and weight utilization from off-loaded cargo is a subject of active design investigation. Commercial air cargo inquiries were our first consideration, and easiest of access.

A tabulation of one month's traffic through Slick Airways' Chicago terminal was made, with Slick by Lockheed and Douglas. Average density of 4,000 pieces and ¼ million pounds of cargo was approximately 21 pounds per cubic foot. Sixty-seven percent of the individual pieces were over 20 pounds per cubic foot in density. Seventy-five percent were hard goods, and the favorite container size less than six cubic feet.

We were given the opportunity with other manufacturers to observe MATS' pallet loading demonstrations at Travis and Westover air force bases. At Travis 75% of the material in their warehouse was eight cubic feet or more in volume, and 50% were 32 cubic feet or more.

Several intercity and interstate motor truck terminals were visited. Although densities were not available, loading times and methods were of interest. Use of fork lift trucks and warehouse pallets is nearly universal for handling goods and loading and unloading semi-trailers. Including the necessary time required in checking of waybills and manifests, an interstate truck can be loaded or unloaded at a warehouse dock of 20,000 to 25,000 pounds of mixed cargo in approximately one hour. Eliminating the detailed paper work reduced this to 30 to 40 minutes. Mechanization resorted to in one highly specialized parcel service reduced loading time to seven minutes. To be truly competitive with the truckers, it would appear that there is room for considerable improvement in this respect in aircraft design. A loading ramp such as provided on the C-130 design is an important step in the right direction, since it will permit fork lift loading or mechanized loading from dock or ground level.

Army Cargo

We took the opportunity to visit the Atlanta General Depot and Fort McPherson to examine the character of Army cargo there. Represented were the Third Army, the Signal Corps, Quartermaster, Medical Corps, Ordnance and Engineers. With the exception of vehicles, vehicular equipment and replacements, it comes in rather uniform sizes and shapes. The bulk of tonnage is in sizes less than eight cubic feet per unit. It is rather dense, averaging about 25 to 40 pounds per cubic foot for rations and clothes, about 35 to 50 pounds per cubic foot for fuel and lubricants, 20 to 30 pounds per cubic foot for ordnance and equipment, and 50 to 100 pounds per cubic foot for ammunition. With densities of this nature, rather small aircraft cargo sections for a given payload can be used and permit less "tin" per airplane with resulting higher efficiencies. Conversely, the C-130A responds efficiently to the "beef" treatment, particularly if the load factor is reduced to the civil level of 2.5, and, as a result, would carry a very substantial tonnage increase in these types of military cargo.

Within the scope of the studies being conducted today there are many problems to which answers must be obtained. One of the most important of these is the best approach in a peacetime economy to the proper development of a standby military capability in the event of need. How can we best acquire this necessary logistics mobility? Other answers are good extrapolations of present data on ton-miles of cargo per year and cargo densities.

Commercial Cargo

Consideration must be given to a civilian cargo movement by air as well as the military logistics operation. History has shown that cargo or freight has become the primary source of revenue in ocean, rail and highway transportation. There is every reason to believe that cargo transportation by air will exceed in revenue the personnel transportation in the relatively near future. Personnel movement has activated modes of transportation, but later freight has become a greater need.

To accomplish this air cargo movement it is necessary to have the proper vehicles—the right type of cargo airplanes capable of operation at low direct operating costs.

The freight movement today is greatly increased over what it was in 1940. The railroads are hauling 50% more volume. An expanded pipeline system, covering some 173,000 miles, now moves triple the tonnage of petroleum compared to prewar figures. Freight on inland and coastal waterways is nearly double that of 15 years ago.

The increase in both passenger and freight transportation is the result of an expanded economy and the tremendous growth in the population of the United States. There are now 30,000,000 more of us than in 1940.

The present movement of cargo by air is merely scratching the surface of a great potential market. The airplane manufacturer and the operator must together make this forward step and prepare to serve this market.

Where the military and the civilian needs are so nearly parallel with regard to a cargo mobility, there is surely room for some overall consideration. The dual concept of a basic military-civilian cargo transport is an approach to a peacetime capability.

The Lockheed C-130A is an airplane which puts us into the middle of this picture. It is an airplane which has the capability of future growth as required in handling its military missions. This same airplane has a growth potential in the cargo field which will offer to the logistics, or to the civilian operator, a direct operating cost of the order of 4¢ per ton-mile as compared to present military cargo airplane of 6¢ per ton-mile.

We believe in cargo transportation by air and are determined to help further its case.

• • •

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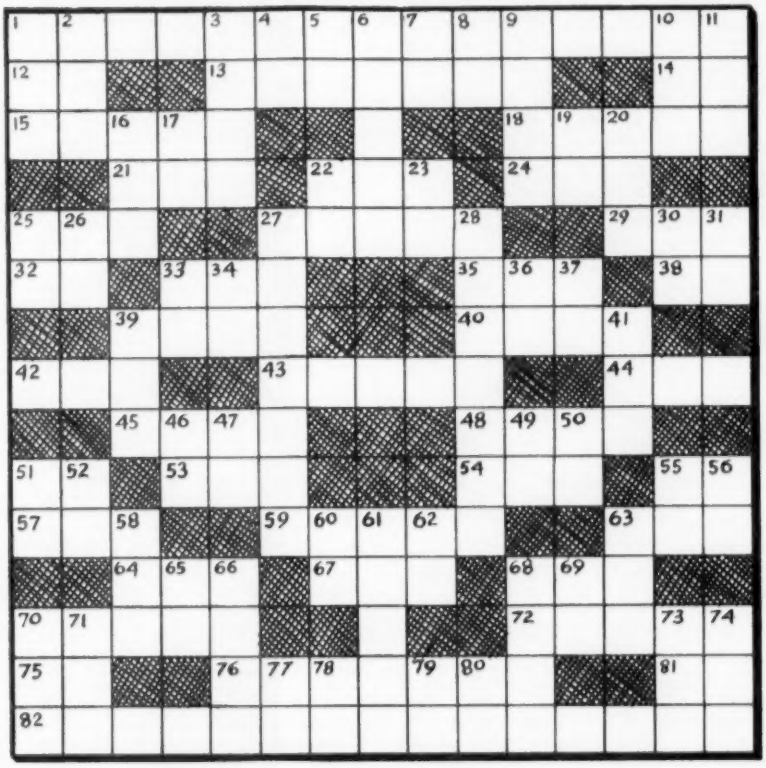
Air Transportation CROSSWORD PUZZLE

(ANSWERS ON PAGE 30)

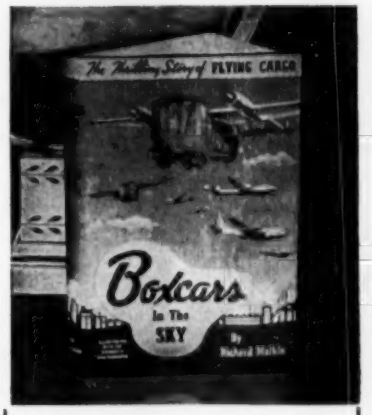


ACROSS

1. Recently "unmerged" from Slick (3 words)
12. Engineering degree
13. Canine (var.)
14. One
15. Served by PAA, BOAC, Swissair, etc.
18. Alter
21. Member of distaff side (colloq.)
22. Everybody
24. Philippine air carrier (abb.)
25. Tariff designation for Washington, D. C.
27. Made more comfortable
29. —— Am
32. Airlines' competitor (abb.)
33. Hearing organ
35. —— France
38. The Big ——
39. Old and experienced airfreight carrier
40. Quantity of paper
42. British airline (abb.)
43. All-freight airline
44. Commercial aviation's counterpart of the ICC
45. Where the sarong is worn
48. Female name
51. State (abb.)
53. Put on
54. Male name
55. Bone
57. Its transpolar air route made world news.
59. Entrances
63. Ralph S. Damon is its president
64. India (poet.)
67. Rustic name
68. Topsy and ——
70. —— Aeree Italiane
72. Netherlands West Indies point served by KLM
75. Not out
76. One who detests
81. Past (suffix)
82. Carrier on the lush New York-Miami route.

DOWN

1. Gave food
2. Immortal general
3. Brad
4. —— Joe
5. Printer's term
6. Pagan gods
7. Headquarters state of Delta-C & S (abb.)
8. Spanish article
9. Harvest
10. Female name
11. Terminate
16. Tariff designation for La Guardia Airport
17. Exclamation of joy
19. Parent
20. Tariff designation for El Paso, Texas
22. It sold its overseas company to PAA (abb.)
23. French article
25. M. D.
26. —, —, Smith
27. Leaving no trace
28. Deprives of light
30. Is
31. Negative
33. Each (abb.)
34. Electric current
36. That is (Lat. abb.)
37. Sun god
39. Flap
41. Airline merged several years ago (abb.)
46. —— lib
47. —— and behold!
49. —— Seversky
50. Sister state of No. 51 across (abb.)
51. Transoceanic competitor of the airlines (abb.)
52. —— Vinci
55. Exclamation of pain
56. Panagra serves that continent (abb.)
58. Moral trespass
60. El ——
61. Outer coat of a seed
62. Printer's measure
63. Greek letter
65. Compass point
66. Proofreader's instruction
68. British title
69. Tariff designation for Vancouver
70. Former United Nations official
71. —— Claire
73. Insect
74. Paid notices
77. Correlative
78. Pertaining to (suffix)
79. Greeting
80. Sound of hesitation



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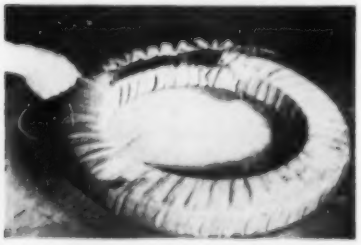
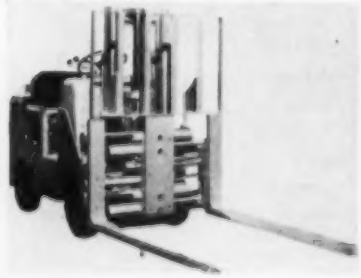
NEW EQUIPMENT FOR THE *Shipper & Carrier*

ELWELL - PARKER ELECTRIC CO.: A unique hydraulic clamp, designed for palletless handling of a wide variety of sizes of cartons, has been introduced for use on Elwell-Parker's complete line of fork trucks. The new attachment saves time formerly required in palletizing loads; in addition, storage space can be used more effectively and the problem of loading and unloading pallets when material is received and shipped is eliminated. Also eliminated or markedly reduced is the usual investment in costly pallets and skids. A variety of clamp arms is available to permit handling nearly any product, ranging from solid cartoned merchandise such as canned goods, soap or oil cans to cartons of noodles or breakfast cereal, egg crates and other fragile items. In addition to the clamping feature, a side-shifter can also be provided to save time and permit accurate spotting of loads. This device is of particular advantage in loading cars or trucks for operation in crowded areas.

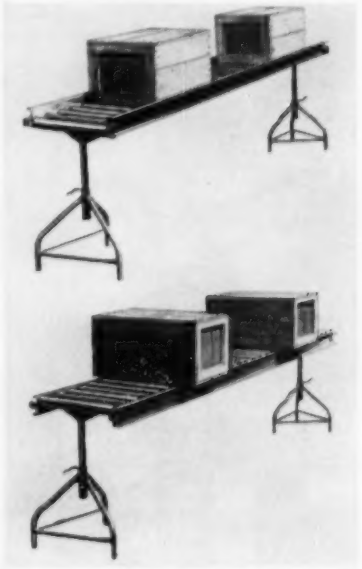
Allegheny Steel Band Company: This company is now producing a new Rip-Cord Opener for packaged light duty steel strapping. Operating like the easy-to-open cigarette and chewing gum packages, the new Rip-Cord enables strapping coils to be ready for use in less than 10 seconds. Time for opening packaged coils formerly ran up to five minutes. The new Rip-Cord Opener is now standard on all packaged coils of Allegheny Steel Band strapping.



Towmotor Corp.: A new type fork accessory has increased fork lift truck efficiency in handling rubber tires. This job-planned fork accessory will handle pallet and skid loads, in addition to its primary function of handling loads of tires of varying sizes without pallets or skids. The accessory consists of special hydraulically adjustable and beveled forks that can pick up a stack of tires mechanically. Forks spread a full 76-inches, if necessary, to clear the outer tire diameter, then close under bottom edge of the tire. The slanted fork edges help cradle the load for transporting, stacking or loading.



Harry J. Ferguson Co.: A new line of lightweight, easy-to-handle, versatile, corrosion-resistant, aluminum gravity roller conveyors that move many different sizes and types of packages and can be used either singly or with existing conveyor systems has recently been developed by this company. The conveyors, which are spark proof, can be obtained in straight sections or 90° curves. The rollers can be set low so that the channel sides act as a guard for small packages or set high for moving packages larger than the width of the conveyors. Roller conveyor units are available in 10' lengths and six convenient widths: 12", 14", 16", 18", 20" and 24". Rollers are 2" in diameter spaced at 4", 5", 6" and 12" centers. Channels are 3½" high and the rollers have steel ball bearings, hex shafts.



BOOKS

ECONOMICS, managment, and regulation are comprehensively covered in G. Lloyd Wilson's **Transportation and Communications** (Appleton - Century Crofts; 757 pages; $6.00). It is divided into seven sections, one of which is devoted to air transportation. A worthy addition to the traffic man's library. . . C. H. Gibbs-Smith's **Aircraft Recognition Manual** (John de Graff; 239 pages; $2.50) includes 85 new planes among the 280 photos and 250 two-view silhouettes. Excellent for civil defense spotters . . . The sizzling history of the history of United States Naval operations in World War II has reached the ninth volume with Samuel Eliot Morison's **Sicily - Salerno - Anzio** (Atlantic-Little, Brown; 413 pages; 6.00). An excellent record of naval operations in the Mediterranean between January, 1943 and June, 1944.

The rise and the fall of the German fighter forces in World II is vividly told by Lieutenant General Adolf Galland in his **The First and the Last** (Henry Holt; 368 pages; $4.95). An interesting addition to the growing list of volumes relating the Nazi airman's side of the war. Here again is the familiar story of internal struggles with Hitler and Goering as well as with the enemy (us) . . . You'll get a bang out of **Old Soggy No. 1** Julian Messner; 249 pages; 4.00), Hart Stillwell's "uninhibited story of Slats Rodgers, Texas barnstormer, throttle jockey, flying bootlegger, and demon cropduster." Here's a lively story about one of the early, traditional seat - of - the - pants pilots—straight out of the new-old West. In case you haven't guessed, Old Soggy is an old crate that somehow was able to fly.

In **Neighborhood Frontiers** (William Morrow; 272 pages $5.00), Earle Stanley Gardner has done himself proud with an account of his travels from British Colombia to Yucatan. The dust jacket says it is "a wise and friendly guide to the beautiful and little-known parts of America." It's just that . . . What with unconquerable mountains being conquered these days, **The Mountain World, 1954** (Harper; 224 pages; $6.00) is very much in order. The English-language edition of the well-known Swiss series, Berge der Welt, the 1954 issue devotes itself primarily, but not entirely, to the Himalayas. Fine photographs . . . The exciting story of the men who opened up wildest Africa piles thrill upon thrill against a backdrop of unusual history in **Tales of the African Frontier** (Harper; 308 pages; $4.00), co-authored by J. A. Hunter and Daniel P. Mannix.

Jacqueline Cochrane's own story was bound to be a good one, and in her **The Stars at Noon** (Atlantic-Little, Brown 274 pages; $4.50) she hasn't disappointed her readers. This is the fascinating story of the world-famous aviatrix—a compelling rags-to-riches biography, from her humble beginnings to Business Woman of the Year. As Mrs. Floyd B. Odlum and as the "Airborne Cinderella," she has rubbed elbows with the world's greats. What she has to say about herself, flying, and the people she has met makes some lively reading indeed.

CROSSWORD ANSWERS

ACROSS

1. Flying Tiger Line
12. EE
13. Airdale
14. An
15. Delhi
18. Amend
21. Gal
22. All
24. PAL
25. DCA
27. Eased
29. Pan
32. RR
33. Ear
35. Air
36. Mo
39. TACA
40. Ream
42. BEA
43. Slick
44. CAB
45. Ball
48. Edna
51. SD
53. Don
54. Ned
55. Os
57. SAS
59. Gates
63. TWA
64. Ind
67. Lem
68. Eva
70. Linee
72. Aruba
75. In
76. Loather
81. Ed
82. Eastern Air Lines

DOWN

1. Fed
2. Lee
3. Nail
4. GI
5. Tr
6. Idols
7. Ga.
8. El
9. Reap
10. Nan
11. End
16. LGA
17. Ha
19. Ma
20. ELP
22. AA
23. Le
25. Dr.
26. C. R.
27. Erasing
28. Darkens
30. Am
31. No
33. Ea.
34. AC
36. i.e.
37. Ra
39. Tab
41. MCA
46. Ad
47. Lo
49. De
50. ND
51. SS
52. DA
55. Ow
56. SA
58. Sin
60. Al
61. Testa
62. Em
63. Tau
65. NE
66. Dele
68. Earl
69. VR
70. Lie
71. Ina
73. Bee
74. Ada
77. Or.
78. An
79. Hi
80. Er

Foreign Airlines

Overseas shippers are reported as giving close attention to the soon-to-begin freight operations of Airwork Atlantic, subsidiary of the British independent, Airwork, Ltd. Opening date is March 1. Parent company, meanwhile, has inaugurated cargo operations between London and Frankfurt, with connections for points beyond. Equipment used are converted *Dakotas* and *Vikings*.

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All other interests ..... 2½¢%

		Gold All Securities Including Non-Negotiables, Documents and Similar Interests	All Other Interests
United States, Canada, West Indies, Central America, Mexico and South America: To or from:			
1. (A)	British Isles, Eire, Greenland, Iceland, Denmark, Norway, Sweden, France, Holland, Belgium, Luxembourg, Portugal, Spain, Switzerland, Italy	1½¢%	2½¢%
(B)	Finland, Germany (exc. Berlin), Austria, Trieste	2½¢%	5¢%
(C)	Czechoslovakia, Poland, Romania, Bulgaria, Hungary, Yugoslavia, Albania, direct shipments only	10¢%	20¢%
(D)	Greece, Cyprus, Turkey	2½¢%	5¢%
2. (A)	Africa except Egypt	1½¢%	2½¢%
(B)	Egypt	5¢%	10¢%
3. (A)	Palestine, Syria, Lebanon	6¼¢%	12½¢%
(B)	Transjordan	7½¢%	15¢%
4.	Iraq, Saudi Arabia	2½¢%	5¢%
5. (A)	Iran, India, Pakistan, Afghanistan	3¾¢%	7½¢%
(B)	Ceylon	2½¢%	5¢%
(C)	Burma	5¢%	10¢%
6.	Australasia, Guam, Samoa	1½¢%	2½¢%
7. (A)	Malaya, Thailand, Hongkong and Kowloon, Formosa	3¾¢%	7½¢%
(B)	Philippines, Japan, Okinawa	2½¢%	5¢%

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		First 2 oz. or fraction	Addl. 2 oz. or fraction	First 4 oz. or fraction	Addl. 4 oz. or fraction	Max. wt., lb.
	Cents					
Aden	25	....	....	....	....	....
Afghanistan	25	....	....	....	....	....
Albania	15	....	....	....	....	....
Algeria	15	$0.48	$0.28	....	....	....
Andorra (Rep.)	15	.45	.25	....	....	....
Anglo-Egyptian Sudan	25	(2)	....	....	....	....
Angola	25	[2].63	.43	$1.45	$0.83	22
Anguilla	10	....	....	....	....	....
Antigua	10	.33	.13	.50	.20	22
Argentina	10	.58	.38	1.51	.76	44
Aruba	10	.38	.18	.72	.36	44
Ascension Island	15	....	....	....	....	....
Australia	25	.84	.63	1.62	1.27	11
Austria	15	.45	.24	1.05	.49	22
Azores	[4] 15	[2].41	.20	.71	.44	11
Bahamas	10	.28	.07	.83	.14	22
Barbados	10	.38	.17	.65	.35	22
Barbuda	10	....	....	....	....	....
Bechuanaland Protectorate	25	[2].68	.47	1.31	.94	11
Belgian Congo	25	.59	.38	1.38	.79	44
Belgium	15	.42	.21	.98	.43	44
Bermuda	10	.27	.06	.76	.13	22
Bolivia	[3] 10	.40	.20	1.08	.40	44
Bonaire	10	.38	.18	.72	.36	44
Brazil	[4] 10	.55	.35	1.48	.64	[4] 44
British Guiana	10	.40	.19	1.07	.39	22
British Honduras	[3] 10	.30	.10	.80	.20	22
British Somaliland	25	....	....	....	....	....
British Virgin Islands	10	....	....	....	....	....
Brunei	25	....	....	....	....	....
Bulgaria	15	(2)	....	....	....	....
Burma	25	[2].90	.70	....	....	....
Cambodia	25	....	....	....	....	....
Cameroons, British & French	25	....	....	....	....	....
Canada (per oz.)	6	(2)	....	....	....	....
Cape Verde Islands	25	(2)	....	....	....	....
Ceylon	25	.69	.49	1.75	1.00	22
Chile	10	[2].48	.28	1.31	.56	22
China	[3] 25	[2].65	.45	....	....	....
Colombia	[3] 10	[2].39	.19	1.21	.40	44
Corsica	15	....	....	....	....	....
Costa Rica	10	.34	.14	.79	.29	44
Cuba	10	[2].28	.07	[5] 1.10	.15	22
Curacao	10	.38	.18	.72	.36	44
Cyprus	25	.50	.30	1.30	.60	22

COUNTRY AIR LETTER SHEETS—10 cents each to all countries. AIR MAIL POST CARDS (SINGLE)—10 cents each to all countries except Canada (4¢), Cuba (8¢), Mexico (4¢), and St. Pierre and Miquelon (8¢).	Air mail letters and letter packages. Per ½ oz.	OTHER ARTICLES[1] (prints, samples, small packets etc.)		AIR PARCEL POST		
		First 2 oz. or fraction	Addl. 2 oz. or fraction	First 4 oz. or fraction	Addl. 4 oz. or fraction	Max. wt., lb.
	Cents					
Liechtenstein	15	$0.43	$0.22	$0.92	$0.46	44
Lithuania	[4] 15	[2].52	.31	1.66	.63	22
Luxembourg	15	.42	.21	.98	.43	44
Macao	25	(2)	....	....	....	....
Madagascar	25	(2)	....	....	....	....
Madeira Islands	[4] 15	[2].44	.24	.75	.50	22
Malaya	25	.90	.70	1.75	1.00	22
Malta	15	.45	.25	1.10	.50	22
Martinique	10	.35	.15	.65	.25	11
Mauritania	25	....	....	....	....	....
Mauritius	25	....	....	....	....	....
Mexico (per oz.)	6	.30	.09	.64	.18	44
Montserrat	10	....	....	....	....	....
Morocco, French Zone	15	.45	.25	1.19	.54	44
Morocco, Spanish Zone, incl. Sp. Zone, Tangier	15	[2].45	.25	1.19	.54	11
Morocco, Tangier, British & French offices	15	.45	.25	1.19	.54	44
Nauru Island	25	....	....	....	....	....
Netherlands	15	.42	.21	.89	.44	44
Netherlands New Guinea	25	....	....	....	....	....
Netherlands West Indies	10	.38	.18	.72	.36	44
Nevis	10	....	....	....	....	....
New Caledonia	25	....	....	....	....	....
New Guinea	25	....	....	....	....	....
New Hebrides	25	....	....	....	....	....
New Zealand	25	.79	.59	1.82	1.17	22
Nicaragua	10	.35	.14	.80	.29	44
Niger	25	....	....	....	....	....
Nigeria	25	.54	.34	1.25	.65	[4] 22
North Borneo	25	....	....	....	....	....
Norway	15	.43	.23	1.02	.47	44
Nyasaland Protectorate	25	....	....	....	....	....
Pakistan	25	[2].63	.43	1.63	.84	22
Palestine (Western Arab)	25	....	....	....	....	....
Panama (Rep.)	10	[2].33	.13	.91	.21	44
Papua (British New Guinea)	25	....	....	....	....	....
Paraguay	10	[2].50	.30	....	....	....
Persian Gulf Ports	25	[2].60	.40	[4] 1.35	.75	22
Peru	[4] 10	[2].45	.25	1.23	.37	44
Philippines (Rep. of)	25	.81	.60	1.81	1.26	[4] 44
Poland	15	.46	.25	1.06	.52	44
Portugal	15	[2].41	.20	.71	.44	[4] 22
Portuguese E. Africa (Mozambique)	25	[2].69	.49	1.63	1.00	22

Czechoslovakia	15	.44	.23	.88	.48	44
Dahomey	25	....	....	....	....	....
Denmark	15	.43	.23	.97	.47	44
Dominica	10	....	....	....	....	....
Dominican Republic	10	.31	.11	.86	.22	44
Ecuador	4 10	.36	.16	1.24	.33	44
Egypt	15	2.52	.31	1.35	.64	22
Eritrea	25	(2)	....	....	....	....
Estonia	4 15	2.52	.31	1.66	.63	22
Ethiopia	25	....	....	....	....	....
Falkland Islands	10	.58	.38	1.26	.76	22
Faroe Islands	4 15	.43	.23	.97	.47	44
Fiji Islands	25	.70	.50	1.67	1.00	22
Finland	15	2.46	.25	.88	.51	44
France, incl. Monaco & Saar	15	.42	.21	1.22	.44	44
French Equatorial Africa	25	.65	.45	....	....	....
French Guiana	10	2.42	.22	.79	.44	11
French Guinea	25	....	....	....	....	....
French India	25	.65	.45	1.75	.90	22
French Oceania	25	....	....	....	....	....
French Somaliland	25	....	....	....	....	....
French Sudan	25	....	....	....	....	....
French Togoland	25	....	....	....	....	....
Gambia	25	....	....	....	....	....
Germany	15	.43	.22	.95	.45	4 44
Gibraltar	15	.45	.25	.75	.50	22
Gilbert & Ellice Islands	25	(2)	....	....	....	....
Gold Coast Colony	25	.52	.31	1.18	.64	22
Great Britain and Northern Ireland	15	.41	.20	1.00	.41	22
Greece, incl. Crete & Dodecanese Islands	3 15	.48	.28	1.07	.57	22
Grenada & Grenadines	10	....	....	....	....	....
Guadeloupe	10	.34	.14	.65	.20	11
Guatemala	4 10	2.33	.12	1.01	.25	44
Haiti	10	2.31	.10	.72	.21	44
Honduras (Rep.)	10	.34	.14	.78	.28	4 44
Hong Kong	25	.90	.70	1.74	1.39	22
Hungary	15	....	....	....	....	....
Iceland	15	2.37	.16	.89	.33	44
India	25	2.64	.44	1.70	.96	22
Indonesia	25	.85	.65	....	....	11
Iran	25	....	....	....	....	....
Iraq	25	2.56	.35	1.47	.72	44
Ireland (Eire)	15	2.39	.18	.97	.37	15
Israel, State of	25	.52	.31	1.42	.67	22
Italy, incl. San Marino	4 15	2.45	.24	1.08	.50	44
Ivory Coast & Upper Volta	25	....	....	....	....	....
Jamaica	10	.30	.10	....	....	....
Japan	3 25	.65	.45	1.27	.91	22
Jordan	25	....	....	....	....	....
Kenya	25	.65	.45	1.35	.85	11
Korea	3 25	.70	.49	1.37	1.01	22
Labuan	25	(2)	....	....	....	....
Laos	25	....	....	....	....	....
Latvia	4 15	2.52	.31	1.66	.63	22
Lebanon (Rep.)	25	.52	.31	1.22	.64	4 44
Leeward Islands (except Antigua)	10	....	....	....	....	....
Liberia	4 25	.48	.27	.86	.56	22
Libya	15	....	....	....	....	....
Portuguese Guinea	25	(2)	....	....	....	....
Portuguese India	25	2.65	.45	1.83	.88	11
Portuguese Timor	25	....	....	....	....	....
Portuguese West Africa (except Angola)	25	(2)	....	....	....	....
Reunion Island	25	....	....	....	....	....
Rhodesia, Northern & Southern	25	....	....	....	....	....
Rumania	4 15	(4)	....	....	....	....
Ryukyu Islands	3 25	.65	.45	1.27	.91	22
Saba	10	.38	.18	.72	.36	44
St. Christopher (St. Kitts)	10	....	....	....	....	....
St. Eustatius	10	.38	.18	.72	.36	44
St. Helena	25	.68	.47	1.31	.94	11
St. Lucia	10	....	....	....	....	....
St. Martin (Neth. part)	10	.38	.18	.72	.36	44
St. Pierre & Miquelon (per oz.)	8	....	....	....	....	....
St. Vincent	10	....	....	....	....	....
Salvador, El	3 10	4.33	.13	1.02	.26	44
Samoa, Western (British)	25	....	....	....	....	....
Santa Cruz Islands	25	....	....	....	....	....
Sarawak	25	....	....	....	....	....
Saudi Arabia	25	.60	.40	1.60	.80	4 22
Senegal	25	.44	.23	.90	.50	44
Seychelles	25	....	....	....	....	....
Sierra Leone	25	....	....	....	....	....
Solomon Islands	25	....	....	....	....	....
Somalia	25	....	....	....	....	....
South West Africa	25	.68	.47	1.31	.94	11
Spain, incl. Canary & Balearic Islands & Spanish offices in N. Africa	15	4.45	.25	1.25	.50	11
Spanish Guinea	3 25	....	....	....	....	....
Spanish West Africa	3 25	(2)	....	....	....	....
Surinam	10	.41	.20	.92	.41	44
Sweden	15	.45	.24	.85	.49	44
Switzerland	15	.43	.22	.92	.46	44
Syria	25	.52	.31	1.22	.64	4 44
Taiwan (Formosa)	3 25	2.65	.45	1.43	1.08	22
Tanganyika	25	.65	.45	1.35	.85	11
Thailand	25	.95	.75	2.29	1.50	22
Tibet	25	2.64	.44	1.70	.96	11
Tonga (Friendly) Islands	25	....	....	....	....	....
Trieste (Free Territory)	4 15	2.45	.24	1.08	.50	22
Trinidad & Tobago	10	.38	.17	1.03	.35	22
Tristan da Cunha	25	.68	.47	1.31	.94	11
Tunisia	15	.47	.26	1.11	.54	44
Turkey	4 15	4.49	.28	1.15	.57	44
Turks Island	10	....	....	....	....	....
Uganda	25	.65	.45	1.35	.85	11
Union of South Africa	25	2.68	.47	1.31	.94	11
Union of Soviet Socialist Reps.	4 15	2.52	.31	1.66	.63	22
Uruguay	4 10	2.58	.38	1.26	.76	44
Vatican City State	15	2.45	.24	1.08	.50	44
Venezuela	3 10	.38	.18	1.27	.36	44
Viet-Nam	25	....	....	....	....	....
Windward Islands	10	....	....	....	....	....
Yemen	25	....	....	....	....	....
Yugoslavia	15	.43	.22	.87	.52	44
Zanzibar and Pemba	25	.65	.45	1.35	.85	11

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26 TACA's latest revised Memorandum Tariff, including air freight rates between cities in the United States and Latin America, and shipping document requirements.

27 The Port of New York Authority *Guide to Air Shipping*, a valuable compilation of general information to assist shippers in expediting the movement of air cargo from the New York-New Jersey area.

28 *Flying Colors*, an excellent 16 mm. motion picture, filmed in sound and color, which dramatizes the restoration of a DC-6 at United Air Lines' famous "push-button" maintenance base at San Francisco. Prints may be borrowed free of charge for showings before groups.

29 Tekwood is United States Plywood's new container material which cuts shipping weight, saves on box costs, and helps reduce warehouse space. A free sample of Tekwood and descriptive literature are offered.

30 *Creative Package Design*, a 20-page booklet which outlines the step-by-step procedure in the development of a corrugated package from the original blueprint to the finished box. It shows how corrugated boxes manufactured by Hinde and Dauch Package Laboratories satisfy special requirements of products protection, marketing channels, and methods of shipping and handling.

31 A four-page brochure in color which describes the Barrett Tractor Ox line of industrial tractors.

32 How the Flying Tiger Line stepped up its materials handling efficiency through the use of fork lift trucks. This booklet shows how congestion of parcels ended and how shipments now clear promptly, permitting faster carrier turnaround.

New Items This Month

It is the policy of the editors to retain each **Come 'n' Get It** item for a period of three months.

The items added this month are Nos. 36 to 48 inclusive.

33 A six-page brochure which describes the line of overhead bridge cranes manufactured by the Michigan Crane and Conveyor Corporation.

34 *Air Freight Memorandum Tariff* (domestic and international) of Northwest Orient Airlines, including a schedule of the carriers renewed overnight cargo service between Twin Cities-Milwaukee and New York.

35 *Air Freight Memorandum Tariff* and a descriptive brochure of Empire Foreign Air Forwarders, Inc., consolidators of international air freight.

36 Air Express International Corporation's International Memo Tariff No. 12, including general and specific commodity rates and charges.

37 A catalog listing of 140 up-to-date books on traffic and transportation is offered.

38 *How to Pack It*, a 30-page book describing and illustrating a dozen different styles and more than 70 types of corrugated boxes for a variety of products. An excellent source for ideas.

39 A 16-page brochure describes Hyster Company's new RC-150 Model, 15,000-pound capacity lift truck. Includes action photos.

40 Here's a handy slide chart which graphically illustrates KLM's multi-stopover travel plan. Includes destinations, rates, etc.

41 An attractive illustrated booklet reviewing the 10 years of air freight history of American Airlines, first carrier to offer a scheduled air freight service to the shippers of this country.

42 The construction and operating features of the new Pallet Ox low-lift electric pallet truck are described in a new illustrated brochure.

43 *Electric Trucks for Special Applications* describes and illustrates 10 different truck models. This bulletin also features special attachments, designed to make the job easier.

44 The Yale Zephyr Hand Lift Truck is pictured and explained in a newly revised four-page booklet. Also included in the booklet is a table providing specifications for the various model numbers.

45 Newly revised Consular Documentary Requirements and Charges for international air shipments are contained in a brochure issued by Air Express International Corporation.

46 *Industry's Flying Partner*, a 20-page booklet on air freight, contains valuable information for shippers. The booklet, issued by United Air Lines, discusses various aspects of air shipping. Illustrations include some of United's new cargoliners.

47 It's often that you require exact copies of your reports, traffic and sales data, records, etc. Here's an attractive brochure providing all the data on Copease, "the world's first office copying machine."

48 *Movement of Life* is the title of a new 20-minute, 16 mm motion picture which depicts the scope and variety of jobs done by conveyors. Primitive methods of materials handlings are contrasted with modern mechanized movement — automation and mechanical handling. The film shows how the development of civilization has depended on controlled movement. Want to borrow it free of charge? Just use the coupon.

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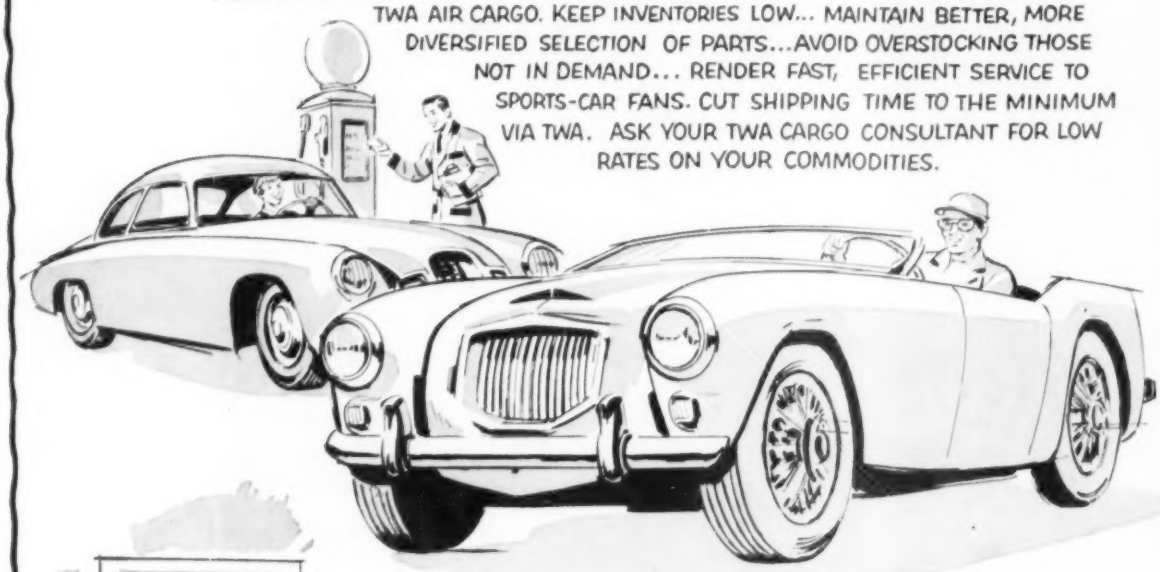

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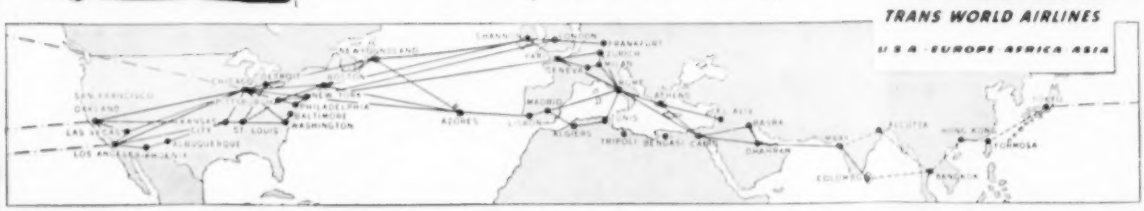
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